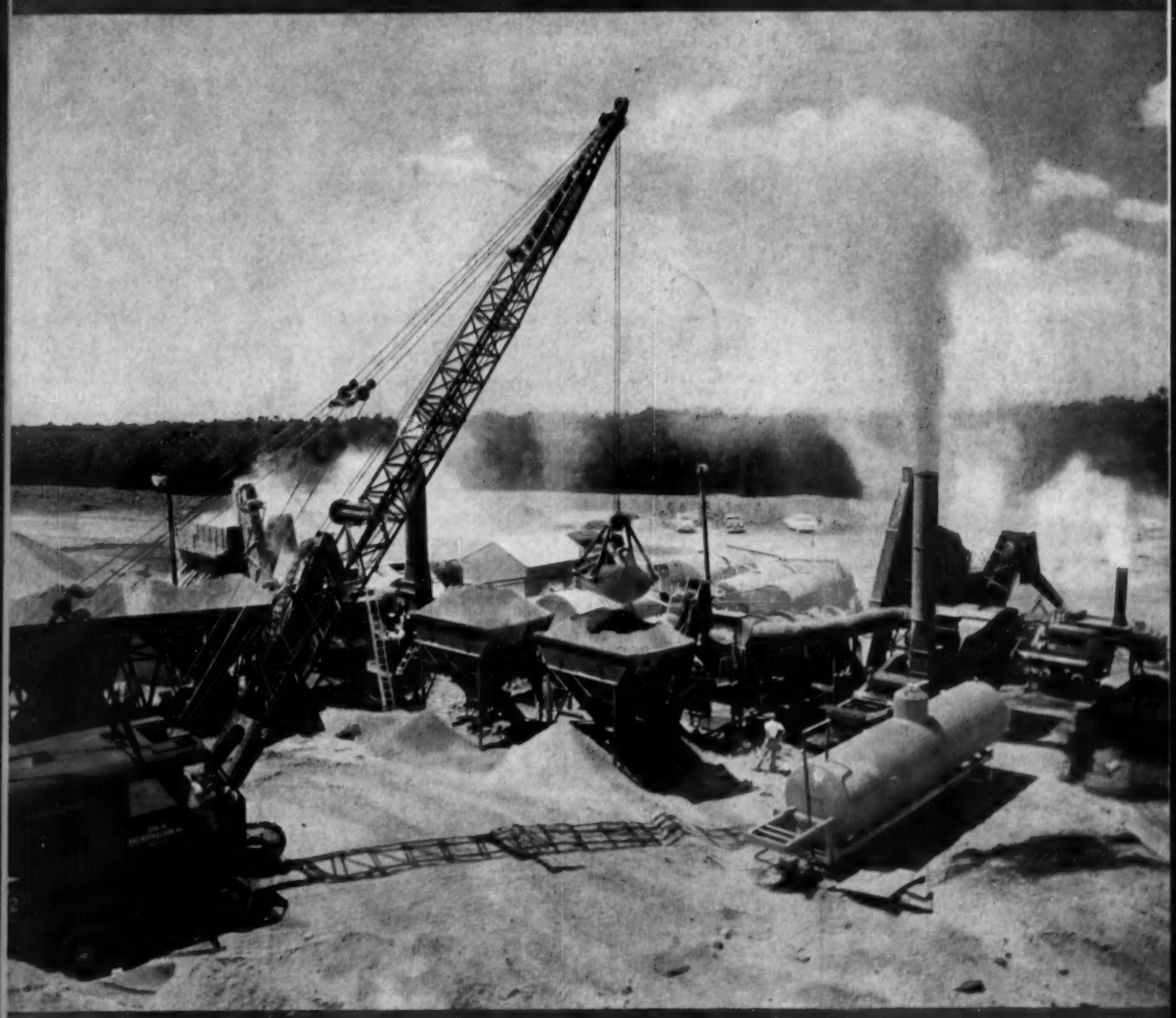
50 CENTS

CONSTRUCTION METHODS AND EQUIPMENT

June 1955



A McGRAW-HILL PUBLICATION

BIGGER Yardage—lower costs

with TORCON'S steady, shockless power

By balancing engine efficiency and horsepower throughout a wide working range, Clark-Torcon torque converters are achieving top performance in every type of installation. The Clark-Torcon "Effective Multiplication Ratio" provides *torque to meet load requirements*—utilizes more of the horsepower more of the time.

Check These Basic Features of the Torcon Line

- **High efficiency over wide range**—produces more work and reduces wear on components.
- **Most accessible unit**—inspection plates easily accessible; no special tools needed for service.
- **Self-contained oil circuit**—sump is an integral part of unit. Oil passages cored in housing—no unnecessary fittings, hoses; no leakage, no external oil seals under pressure.
- **Individually cast single-piece elements**—no welds or fabrications to distort under extreme loads.
- **A complete line**—15 to 600 H.P.
- **Broadest line of options**—readily adaptable to a wide range of applications:

Excavator cranes • Grading machinery • Oil drilling rigs • Logging equipment • Heavy duty trucks and buses • Tractor Shovels

The Clark-Torcon is a standard "package" unit mass-produced with pump, sump, and pressure regulator integral. It is available off-the-shelf to engine and original equipment manufacturers, and to owners and operators. With its wide range of wheel diameters and choice of options, the Torcon unit can be fitted readily into your power-transmission system.

Check Torcon's important quality features; and send for an illustrated bulletin—use the coupon.

There's a Torcon to
FIT YOUR NEED
...send for this important bulletin

A brief, clear statement concerning torque multiplication, with illustrations showing the superior features of Clark-Torcon design. The coupon brings your copy—no obligation.

SCHNEIDER SYSTEM

CLARK® EQUIPMENT

CLARK EQUIPMENT COMPANY
Falahee Road
Jackson 1, Michigan

Please send the Clark-Torcon Bulletin

Name _____ Position _____

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City _____ Zone _____ State _____

B.F.Goodrich

All-Nylon All-Purpose tires roll 55,000 miles for building materials company

HIGHWAY, shopping center, housing development, industrial plant — all types of construction use concrete and a host of other materials from Hilltop Building Materials, Inc., of Cincinnati. 100 ready-mix trucks, 20 dump trucks and 6 flat bed trucks range over southwest Ohio highways, on rock and rut-choked roads, as often on no roads at all.

That's why Hilltop uses B. F. Goodrich *all-nylon* All-Purpose tires. The report: *all-nylon* All-Purpose tires can be recapped, give up to 55,000 miles of service.

All-Nylon body

Nylon is stronger than ordinary cord materials, withstands double the impact and resists heat blowouts and flex breaks. B. F. Goodrich *all-nylon* All-Purpose tire body outwears even the extra-thick tread—up to 67% deeper than that of a regular tire, can still be recapped over and over!

Put an end to unnecessary tire failures and costly maintenance. See your B. F. Goodrich retailer now and find out how *all-nylon* All-Purpose and other off-the-road tires can save you money. (Also available in lower-cost rayon construction.) Look under Tires in the Yellow Pages of your phone book or write *The B. F. Goodrich Co., Tire & Equipment Div., Akron 18, Ohio.*

Specify B. F. Goodrich tires when ordering new equipment.

"ALL-PURPOSE TIRES give excellent traction and clean very well," says Hilltop Fleet Superintendent Edgar Pitzer.

A 20-TON LOAD of concrete at a construction site. Hilltop gets a longer run-per-dollar from all-nylon tires.

RESEARCH KEEPS B.F.Goodrich FIRST IN RUBBER

CONSTRUCTION METHODS AND EQUIPMENT

Volume 37 Number 6

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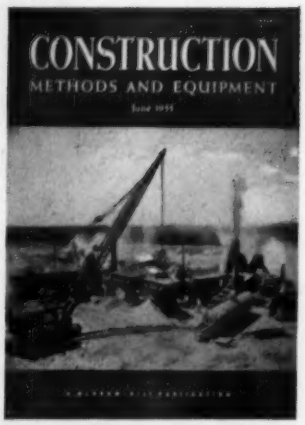

On the Cover

Tioga Construction Co. produces 300 tph of bituminous concrete for New Jersey's Garden State Parkway with two Barber-Greene 848 continuous asphalt plants. Behind standard 848 is new 200-tph king-size unit, and both are fed by same Manitowoc crane with 2-yd Owen clam. Bigger plant features 9x20-ft dryer, 16-cyclone dust collector, 4x12 Symons 3½-deck horizontal vibrating screen, and higher speeds throughout. Tioga, from Lancaster, Pa., is paving subcontractor to George M. Brewster & Son, Inc., Bogota, N. J.

COMING IN JULY—Valuable maintenance information will fill the entire July issue of *Construction Methods and Equipment*, which that month will be devoted entirely to helping the contractor keep his equipment productive at lowest cost for longer periods. Included will be an up-to-date listing of service manuals.

Member ABP

Published monthly by McGraw-Hill Publishing Co., Inc., James H. McGraw (1860-1948) Founder.

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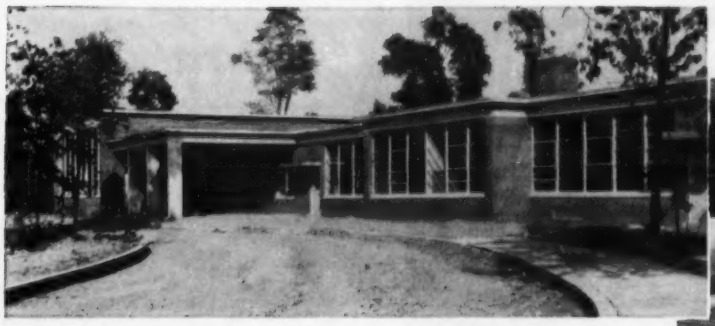
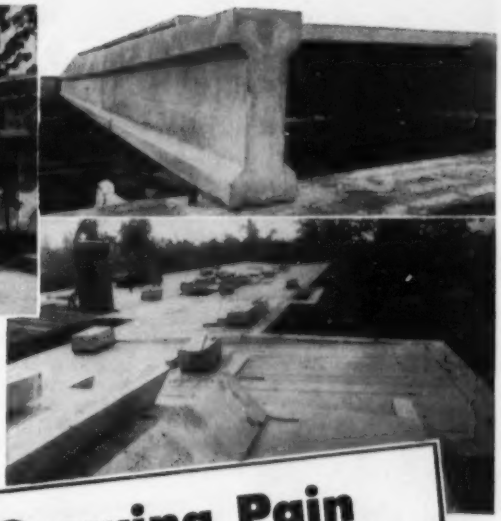
Pay Dirt in This Issue

June, 1955

NEXT MONTH

Top-flight equipment maintenance is a basic key to success in construction. CM&E for July will be loaded exclusively with maintenance ideas from contractor and manufacturer. Be sure to read and save your copy. It will be useful the year around.





HERE IS THE ULTIMATE in concrete prefabrication, including precast long-span channel slabs, precast columns, joists, roof units, spandrels, sunshades, every unit field practical for fast erection. GERTRUDE C. FALWELL SCHOOL, Mt. Holly Township, N. J. Members precast with 'Incor' by FORMIGLI ARCHITECTURAL STONE CO., Williamstown Junction, N. J., erected by Formigli's Structural Service. Architects, MICKELWRIGHT & MOUNTFORD, Trenton; General Contractor, THOMAS PAGAN, INC., Pennsauken, N. J.

Rx for a Nationwide Growing Pain

Concrete Provides Time- and Money-Saving Solution for Critical School Shortage

★

AMERICA has a case of growing pains, and nowhere more so than with schools. Sound design and building know-how is avoiding skimpy construction in meeting urgent need. Careful analysis almost invariably shows that concrete provides utmost value in attractive, durable, fire-safe structures.

Such is concrete's flexibility that it is possible to meet almost any school-building budget and assure a structure of highest quality from every standpoint. Two examples:

One represents prefabricated concrete construction at its best, with factory-made, quality-controlled members, produced to closest tolerances, for fast erection with minimum supervision . . . quality concrete elements, produced at assembly-line speed—and economy—with 'Incor'* 24-Hour Cement.

The other is a reinforced concrete school whose outstanding architectural treatment expresses in clean, uncluttered line the sound structural values which make concrete the first choice for schools.

Two of many fine, new schools, built with Lone Star Cements, providing the finest in modern construction at minimum cost, initially and through the years.

*Reg. U.S. Pat. Off.

WEST CHARLOTTE HIGH SCHOOL, Charlotte, N. C., is an outstanding example of attractive contemporary design in concrete. Vertical lines of exposed columns lend interest to the façade of this beautiful, reinforced-concrete structure, which well deserves its merit award as a national contest winner. Architects, GRAVES & TOY; General Contractor, C. D. SPANGLER CONSTRUCTION CO., INC.; Ready-Mix Lone Star Cement Concrete supplied by JOHNSON McMILLAN CONCRETE CO., INC.—all of Charlotte.

LONE STAR CEMENTS COVER THE ENTIRE CONSTRUCTION FIELD

LONE STAR CEMENT CORPORATION

Offices: ABILENE, TEX. • ALBANY, N. Y. • BETHLEHEM, PA. BIRMINGHAM • BOSTON • CHICAGO • DALLAS • HOUSTON INDIANAPOLIS • KANSAS CITY, MO. • NEW ORLEANS • NEW YORK NORFOLK • RICHMOND • WASHINGTON, D. C.

LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 18 MODERN MILLS, 141,600,000 SACKS ANNUAL CAPACITY

Job Talk...

. . . About Methods

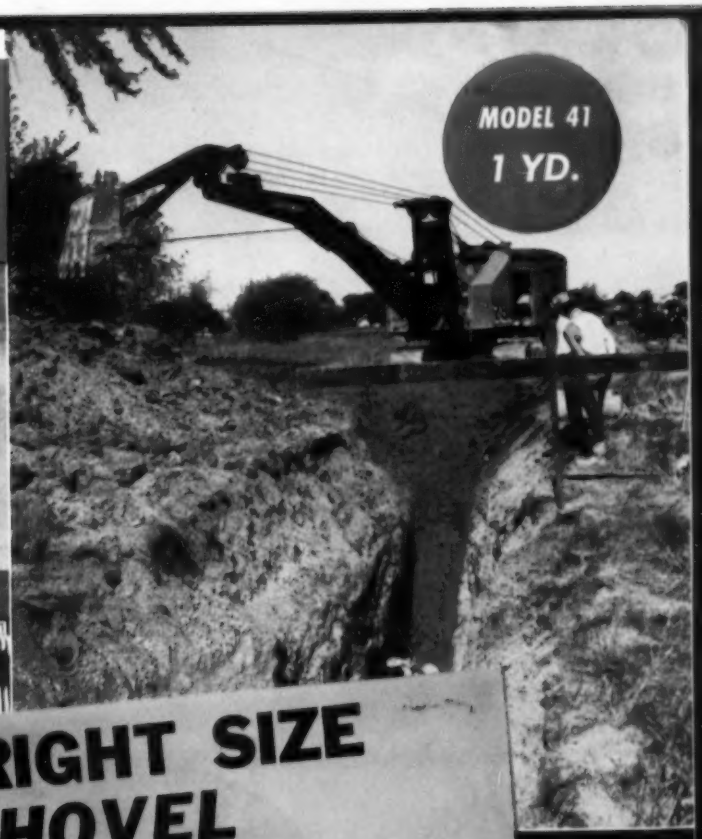
Crane-Hung Tray . . .

Rip-Raps Slope

A steel tray hung from a Manitowoc crane is proving to be a good device for riprapping the slopes of two huge sand islands under construction in Hampton Roads, Va. Stones are dumped into the tray from trucks. The crane swings the load over the slope, and lowers it into position. A line on the back tilts the tray and slowly slides it up the slope, spreading the stone in a uniform layer. The sand islands will be part of the new bridge-tunnel spanning Hampton Roads at Old Point Comfort. Merritt-Chapman & Scott Corp. is the contractor.

(Job Talk continues on page 10)

YOU CAN'T HAVE
NORTHWEST
ADVANTAGES
UNLESS YOU OWN
A NORTHWEST

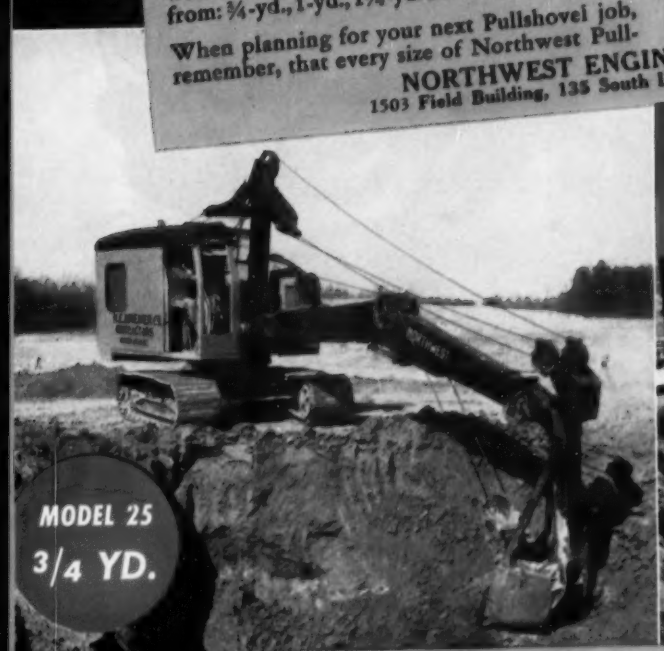


GET THE RIGHT SIZE PULLSHOVEL For Your Jobs

What size ditching and trenching job? Northwest has the rig for it—four sizes to choose from: ¾-yd., 1-yd., 1¾-yd. and 2½-yd. capacity!

When planning for your next Pullshovel job, remember, that every size of Northwest Pullshovel has been proved in service beyond any other similar equipment. Northwest Pullshovels are fast, give you plenty of reach and high output. Ask for a catalog and talk your problem over with a Northwest Man.

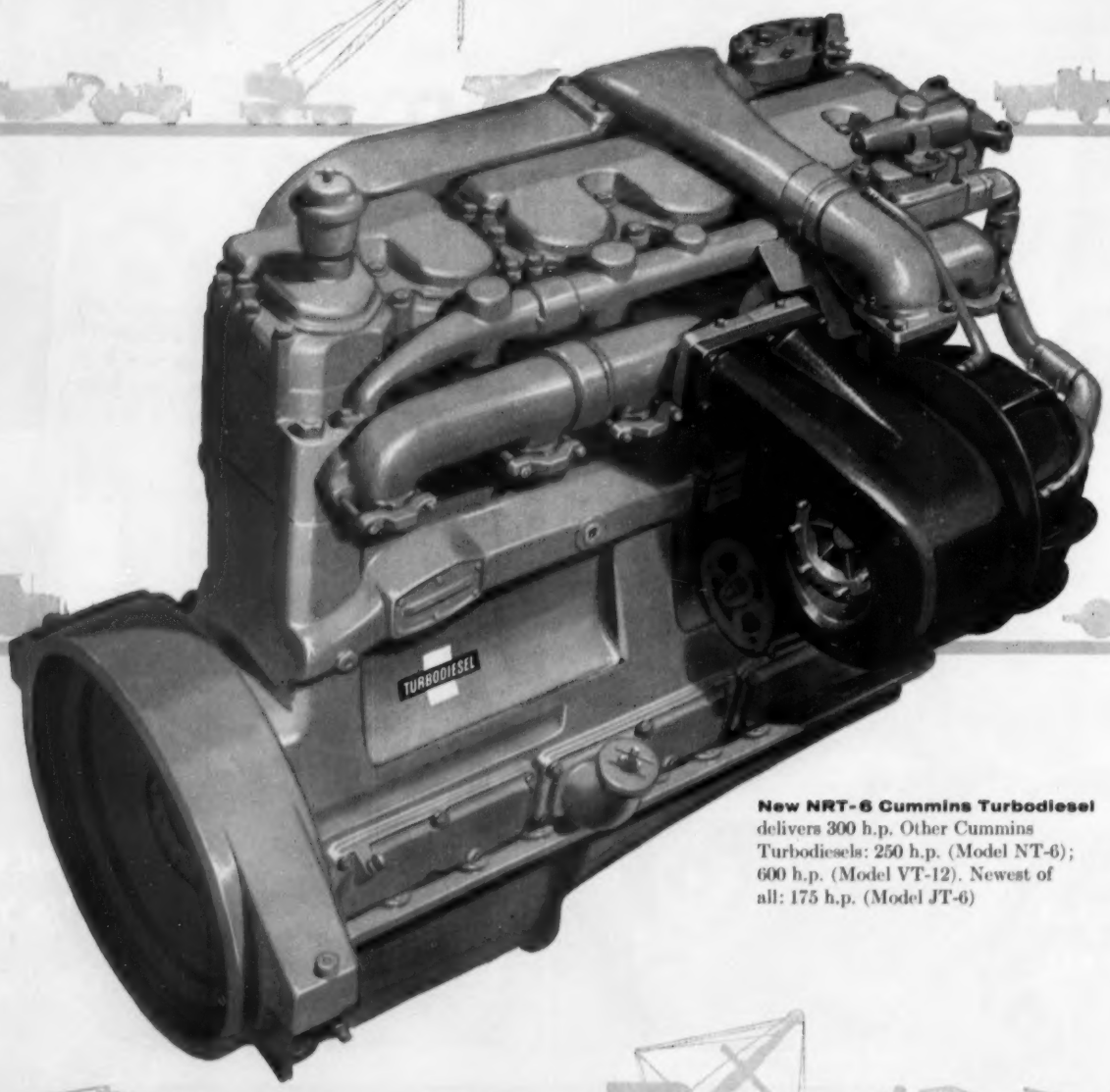
NORTHWEST ENGINEERING COMPANY
1503 Field Building, 135 South La Salle Street, Chicago 3, Illinois



NORTHWEST

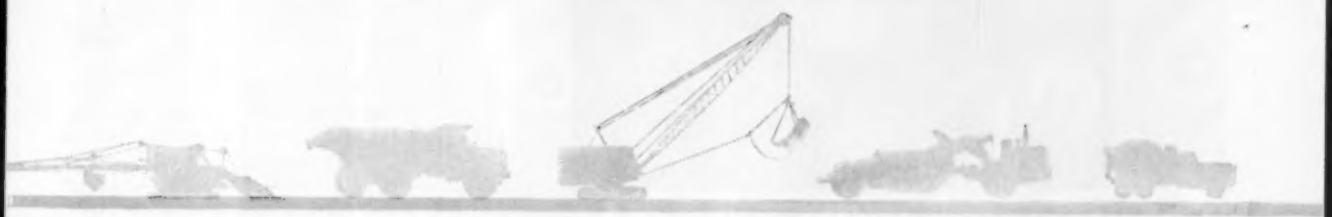
Now available for all kinds of construction equipment...

New Cummins



New NRT-6 Cummins Turbodiesel delivers 300 h.p. Other Cummins Turbodiesels: 250 h.p. (Model NT-6); 600 h.p. (Model VT-12). Newest of all: 175 h.p. (Model JT-6)

Turbodiesels

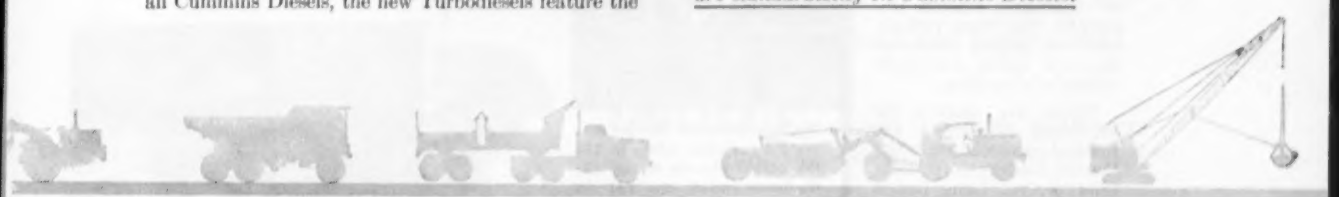


POWER!.....PERFORMANCE!.....PROFIT!

Here's a new power concept to make *your* construction jobs more profitable. Cummins Turbocharging brings you extra diesel horsepower without added engine weight by harnessing the energy in normally wasted exhaust gases . . . boosting engine efficiency.

Field tests on all kinds of construction jobs show significant savings in time, fuel and equipment. And like all Cummins Diesels, the new Turbodiesels feature the simple to understand and service PT fuel system and easy-as-gasoline maintenance. Added time-saving economy feature for construction men: special service and parts availability on job sites is arranged by your local Cummins distributor to serve *your* needs.

No wonder *more and more construction men today are standardizing on Cummins Diesels.*



CUMMINS diesels give you the big plus **MORE PROFIT**

Cummins Engine Company, Inc.
Columbus, Indiana

I am interested in finding out more about the advantages of Cummins Turbodiesels. Please send me:

_____Your directory of manufacturers offering Cummins Diesels in their equipment.

_____Your booklet illustrating Turbodiesel principles.

I am interested in converting my present equipment to Turbodiesel power.

_____Please have your representative call.

Name_____

Position_____

Company_____

City_____ State_____

CM-6

JOB TALK . . .

Continued from page 6

Backfill Blade

A swiveling plate fastened to bucket teeth makes a handy backfilling blade for Jack & Jim Maser Inc., Brownstown, Pa. Their operating engineer Daniel Peffley, writes, "Enclosed find snapshot of an attachment we had made to fit on hoe to backfill in space where it is unhandy to do same with other machine. It also prevents teeth from tearing up street or lawn.

"It is in two pieces, and swivels 6 in. [around a pin to the center tooth] to follow contour of the surface. Teeth on the outside are welded to top piece of blade. Just drive out pins holding teeth on shanks. Take off bucket teeth and slide the blade on and pin fast, same as changing teeth. Works swell in close quarters."

Metal Detective

To find wires, reinforcing steel, beams or pipes in walls, which often added to his costs, Miami Air-Conditioning Contractor David Mahoney developed an electronic detector. Powered by two 1½-v and one 67½-v dry-cell batteries, the unit emits a whirring sound

(Continued on page 16)

Barber-Greene Car Unloader
feeding 150 T. P. H.

UNLOAD

UNLOAD the cheapest way.

UNLOAD practically automatically.

UNLOAD a railroad car in less than 45 minutes

UNLOAD virtually all bulk materials with one machine.

UNLOAD with the positive chain-belt drive — no slippage, even when starting under full load.

UNLOAD with the machine above or below the rails.

Model 358 Unloader.
Gasoline or electric. Steel wheels or pneumatic tires. Towing hitch. High discharge height.

Let us show you how the Model 358 can solve your unloading problems.

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AURORA, ILLINOIS, U.S.A.

BG

WRITE for INFORMATION

descriptive literature . . . sound movies

cost studies . . . nearby job inspection . . . plant layouts

NO-SPILL SWINGS are possible with an exclusive dipper pitch brace arrangement which is standard on American Backhoes. This feature enables the operator to tuck the dipper up at an angle that keeps the load from spilling.

With anti-friction bearings in the clutch drums, on clutch shafts and at every vital point, American Cranes give you smoother, more accurate operation and faster cycles. That's why more and more contractors are specifying American.

American Backhoe with Exclusive Dipper Pitch Brace Arrangement...

DIGS, SWINGS, LOADS FASTER WITHOUT SPILLING

GREATER DUMPING RADIUS while loading is another important advantage offered by American Backhoes. The exclusive dipper pitch brace arrangement permits the operator to load trucks farther from the machine and at a lower boom angle without spillage. The boom and dipper stick on the American Backhoe are of box type construction which provides great strength with relatively light weight.

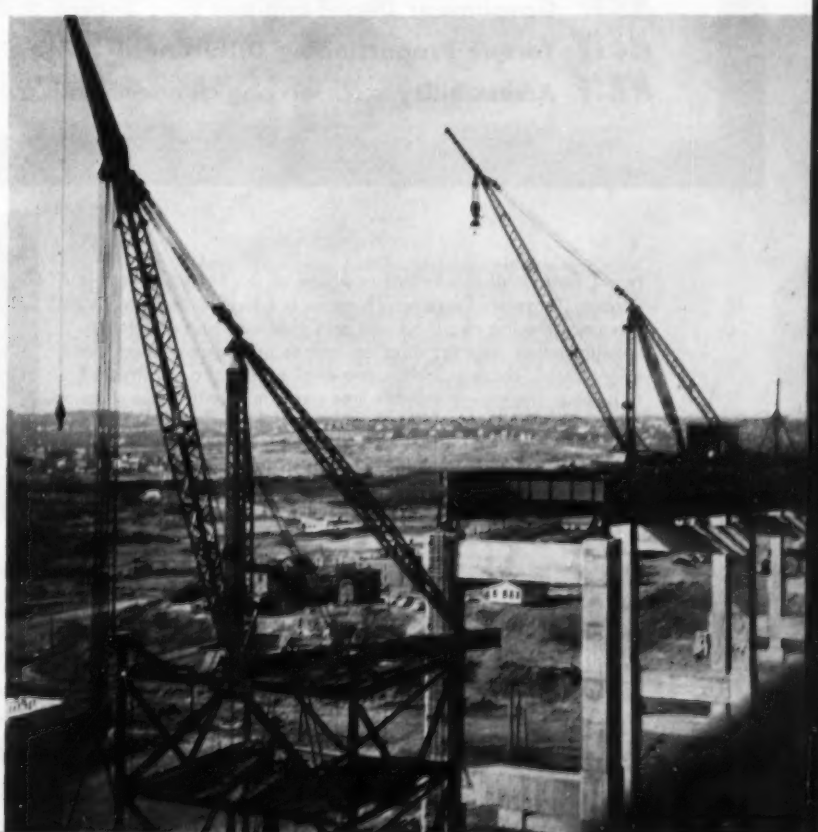
Despite below-freezing temperatures, rain, snow and ice on a building addition job in St. Louis, the C. Rallo Contracting Co. was impressed with the production figures of their new American 300 Series Backhoe. Using American's exclusive dipper pitch brace arrangement, Rallo officials found they could dig faster and could make more swing-load cycles per hour without spilling. To increase production, even under adverse conditions, progressive contractors like the Rallo Company are switching to industry's most efficient backhoe—an American 300 Series Backhoe.

FASTER DIGGING, even in the tight quarters found on this building addition job, was experienced by the Rallo Company with the American Backhoe. Because of the sharp dipper pitch made possible by American's exclusive brace arrangement, loads are handled at a larger radius. This means shorter swing arcs—permitting close work.

"I DIG MORE in a day with American," says the Rallo Company's veteran operator, Bill Jones. With American's dipper pitch arrangement, I can really turn out a day's work," he says, "and I'm less tired at the end of the day." Anti-friction bearings in American's brake linkage cuts leg effort in half, minimizing operator fatigue and increasing production.

A GREAT HERITAGE, earned on the world's biggest and toughest jobs over the past 78 years, stands behind every American product. This wealth of engineering experience is evident in American 300 and 700 Series Crawler Cranes, which today do more work, hour for hour, than any other cranes in their field. For factual, helpful information on how American Crawler and Truck Cranes can increase production and cut costs on your projects, see your American Distributor, or write American Hoist & Derrick Co., St. Paul 1, Minnesota.

700-14-10



COMPLET

3-WHEELED ROLLERS

NEW **Torque Converter Drive** . . . smooth, powerful
NEW **Variable Weight** . . . water or wet sand ballast
NEW **Visibility** . . . with low center of gravity, and high ground clearance
NEW **Gasoline or Diesel Engines** . . . 2-speed or 4-speed transmissions
NEW **Torque Proportioning Differential** . . . maintains traction under difficult conditions
NEW **Accessibility** . . . servicing all assemblies is quick and easy

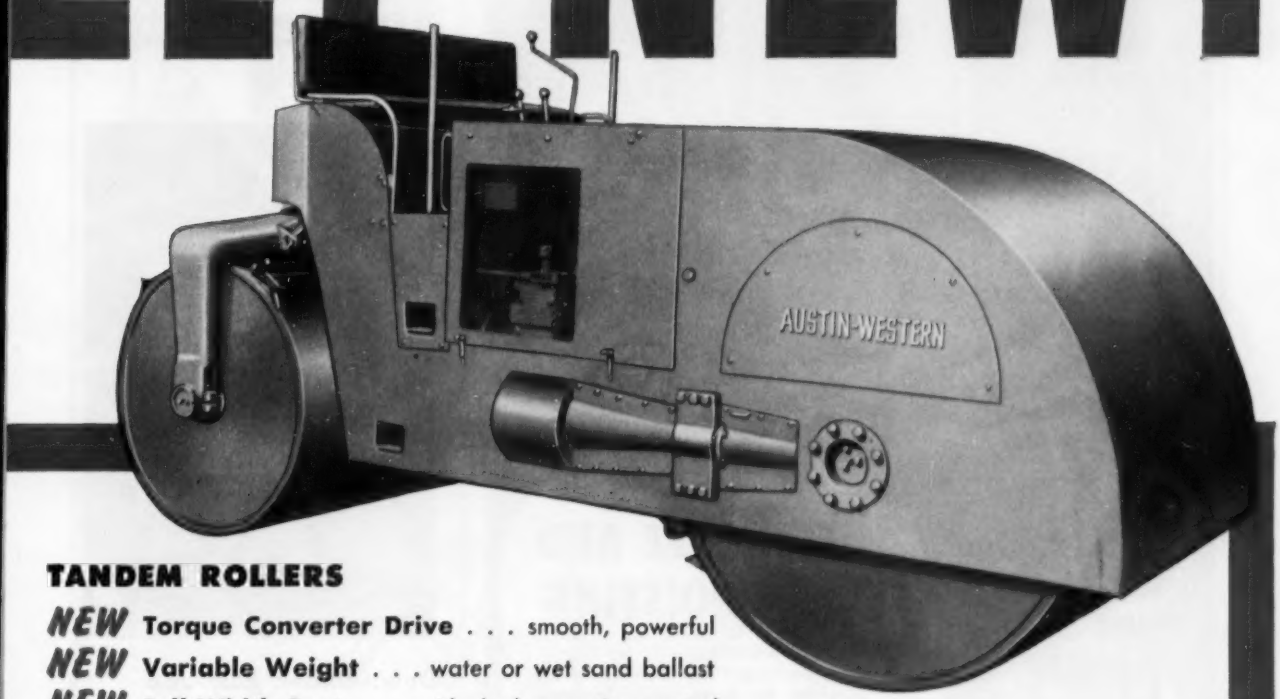
No. 1 feature of this brand new line of 3-wheeled rollers is Torque Converter Drive which controls power automatically, increases the life of power unit and clutches, cushions the reversing action, and provides an infinite number of speeds. In every detail, these machines are engineered and constructed to provide the superb, trouble-free performance that has characterized A-W 3-wheeled rollers through the years since Austin built America's first motor road roller in 1907. Made in 5-7, 6-8, 7-10, 8-11, 10-12 and 12-14 ton sizes.

Austin-Western
Power Graders · Motor Sweepers
Road Rollers · Hydraulic Cranes

BALDWIN BLH LIMA-HAMILTON
Construction Equipment Division

Manufactured by
AUSTIN-WESTERN COMPANY
Subsidiary of Baldwin-Lima-Hamilton Corporation
AURORA, ILLINOIS, U.S.A.

ELY NEW!



TANDEM ROLLERS

NEW **Torque Converter Drive** . . . smooth, powerful
NEW **Variable Weight** . . . water or wet sand ballast
NEW **Full-Width Seat** . . . with dual operating controls
NEW **Visibility** . . . with low center of gravity, and high ground clearance
NEW **Gasoline or Diesel Engines** . . . 2-speed or 4-speed transmissions
NEW **Accessibility** . . . servicing all assemblies is quick and easy

While the Torque Converter Drive described on the opposite page is probably their most important feature, this new line of tandem rollers incorporates many other refinements designed to provide exceptionally smooth performance on precision jobs. Modern industrial engines furnish a smooth flow of steady power; uniform weight distribution eliminates side sway; effortless hydraulic power is used for steering . . . such features are your assurance of dependable, low-cost service. Available in 5-8, 8-12 and 10-14 ton sizes.

Get all the Facts ...

AUSTIN-WESTERN COMPANY
607 Farnsworth Avenue, Aurora, Illinois
Please send complete information and literature on Austin-Western Rollers.

Name .....
Title .....
Company .....
Street .....
City ..... **Zone** ..... **State** .....

JOB TALK . . .
Continued from page 10

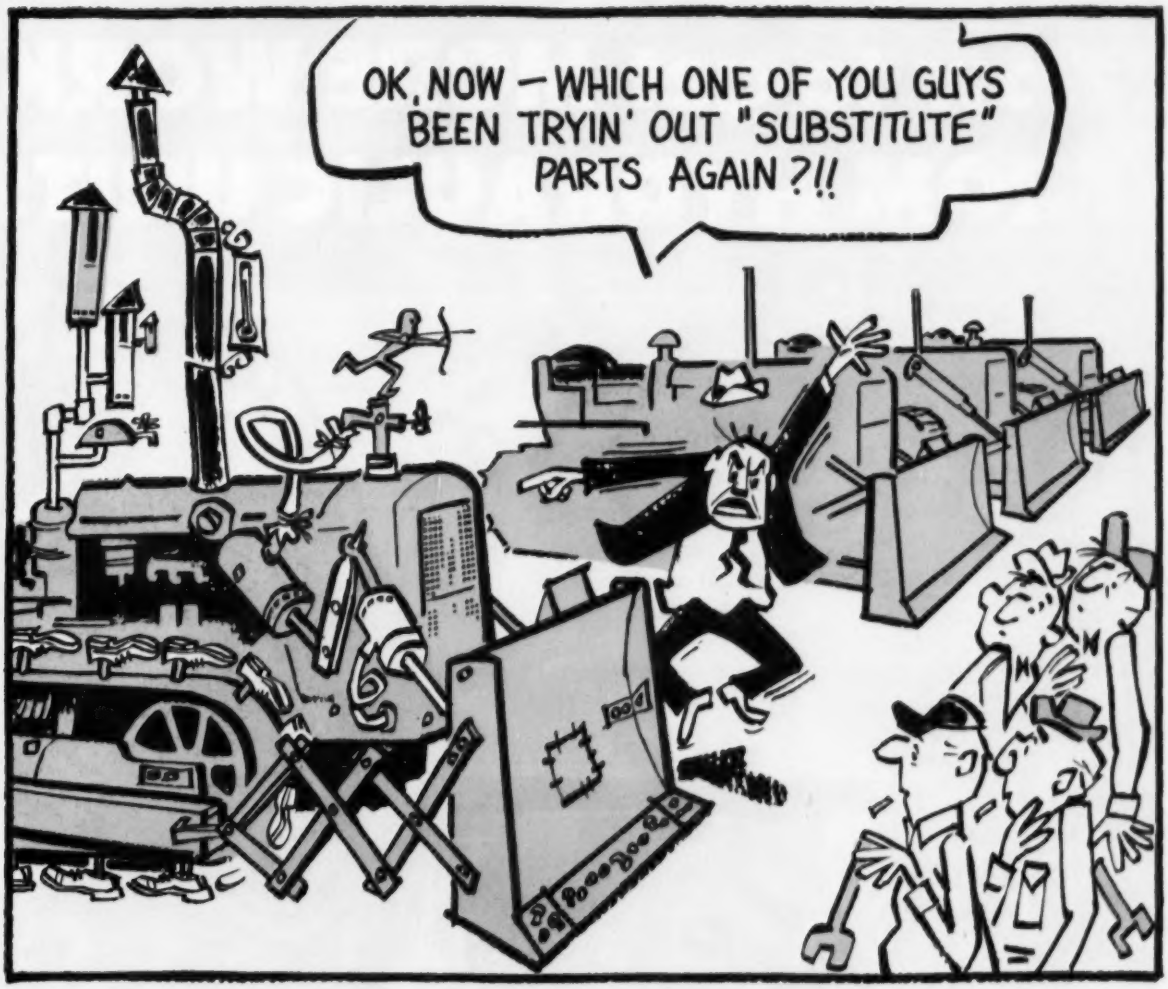
that lowers or ceases as metal is approached. Mahoney estimates that his first instrument cost in the neighborhood of $400, including experimental work. However, he says he saved more than enough to pay for it on one job where he installed 60 wall air-conditioning units.

Down-Under Bolt Job

In Philadelphia, renovation of the city's subway system is being speeded with RBW high-strength bolts. The Philadelphia Transportation Dept. specified bolted construction because of limited working areas and safety of passengers on passing trains. Working crews were able to set and tighten bolts during normal heavy daytime traffic. Belmont Iron Works has the contract for renovation; and steel erection contractor is Ralph Cornell.

Better Grouting

Castings for machinery bases often lack sufficient grout holes. As a result, the casting is not always grouted full. And shrinkage of grout in a deep casting is another adverse factor. So George Goodwin, with Fletcher-Merritt-Raymond on a New Zealand papermill job, suggests inverting the casting and filling it with concrete. After the concrete has set, the unit can be turned over, placed, and grouted as you would a base plate.



Down time is no joke. Best way to avoid it is to insist on genuine CAT* parts every time. Then you're sure of getting parts that are made to the latest design, precisely manufactured of the right materials, rigidly inspected and tested.

Take filters, for example

Non-genuine Caterpillar filter elements look like the real thing. They'll fit, too. They may even have plastic-impregnated elements — but how much surface area do they have? Look at the picture below. It shows what a genuine Cat surface-type filter is like *inside:* a plastic-impregnated paper element that does not absorb water, accordion pleated, for maximum surface area, around a perforated metal tube, enclosed in a perforated paper cover. This filter will *not* remove oil additives. It *will* remove abrasive particles as tiny as 39-millionths of an inch. A substitute filter — well, who can be sure?

The difference on the job: working in heavy dust, even in mud and water, genuine Cat filters — matched to the requirements of Caterpillar Diesel Engines — will keep these engines running longer, will keep maintenance costs low.

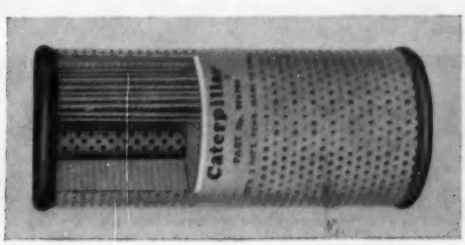
With substitute parts: who can be sure?

Better get genuine Caterpillar parts every time.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks — ®



BY KEEPING hydraulic systems free from sludge, rust and foam, you eliminate a major cause of unscheduled stoppages, keep your machines on the job. You can do this by using *Texaco Regal Oil R&O* as your hydraulic medium.

Tests prove that *Texaco Regal Oil R&O has more than ten times the oxidation resistance* of ordinary turbine-quality oils. Users report it has an exceptionally long service life, even under severe conditions, and does a remarkable job of preventing sludge, rust and foam.

Texaco Regal Oil R&O thus assures clean, trouble-free operation, longer life for pumps and other parts, lower maintenance costs. There is a complete line of *Texaco Regal Oils R&O* to meet the requirements of all types and sizes of hydraulic equipment, all operating conditions.

In air compressors, too, *Texaco Regal Oil R&O* assures clean, efficient, low cost performance. It keeps compressors and systems free from harmful deposits and rust . . . lines clear, piston rings free, valves clean.

Texaco Regal Oil R&O is one of the six fine products in the Texaco Simplified Lubrication Plan—all you need to handle all your major lubrication. Let a Texaco Lubrication Engineer give you full information. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

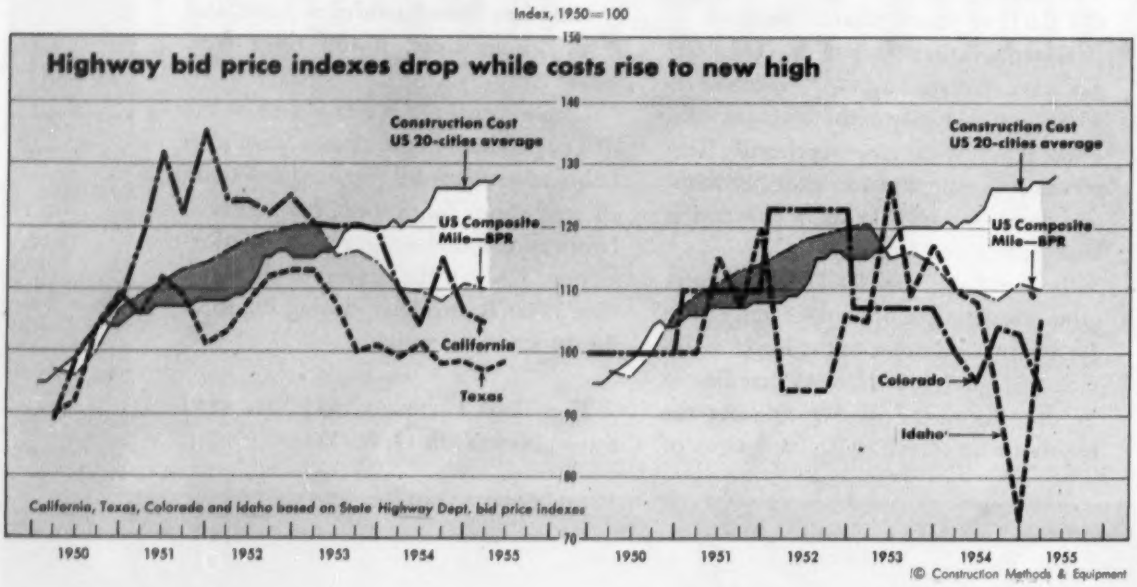
☆ ☆ ☆

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

It's Your Business . . .



Are Highway Contractors Bidding Themselves Into a "Profitless Prosperity"?

- **Bid prices are dropping further in '55 while . . .**
- **Costs are rising faster this year than last . . .**
- **New work available is booming to a record**

CONTRACTOR BID PRICES on highway jobs dropped down another notch during the first quarter of this year. Yet a new, faster uptrend in costs is rolling and highway contract awards are running away from previous records. This is putting a tighter squeeze on contractor profits—what's left of them, that is—than during the rough 1953-54 period.

How can contractors stay in business by charging bargain prices for their work while their costs of men, materials and equipment are rising faster this year than last? Could be that some are signing up such a large volume of work this year that they can keep their men and machines moving fast from one job to the next. That sort of mass production could mean big gains in over-all productivity and reduced job costs.

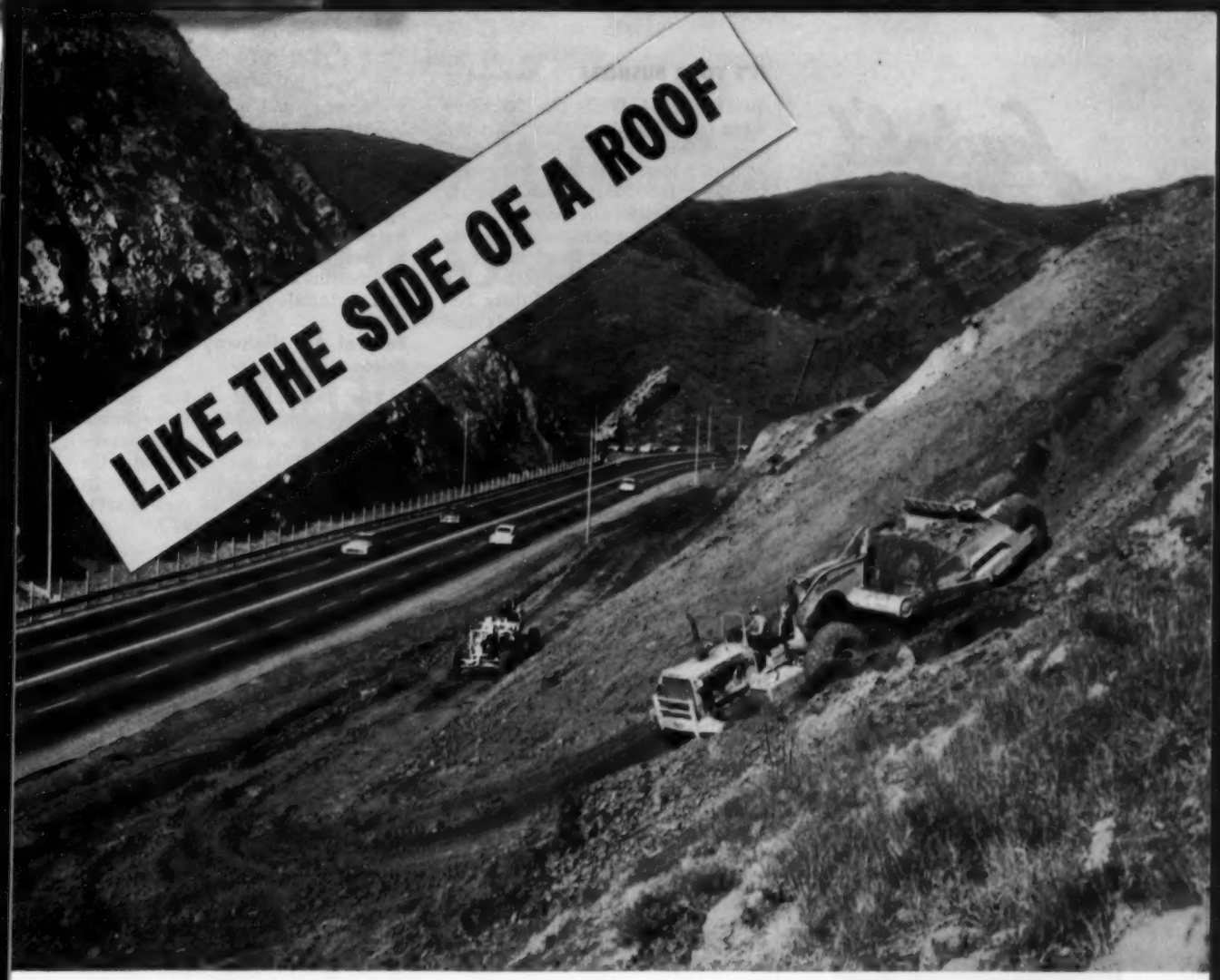
Even if this is true, how much of a profit can contractors in California, Colorado and Texas make on bid prices which during the first three months of this year were the lowest for any first quarter since 1950? Between the end of 1950 and December '54 construction costs have risen substantially in all of these states. For instance, costs of materials and labor climbed by 25% in Los Angeles, 24% in San Francisco, 20% in Denver and 11% in Dallas, according to CM&E Indexes. Highway contractors, like their counterparts in other lines of construction, are noted for their ingenuity in cutting costs. However, the current cost-price squeeze may prove too much for their ingenuity.

Furthermore, the better availability of materials and more stable labor supply which helped contractors keep jobs on schedule during '54 may be upset this year. Heavy demand has tightened cement and steel supplies in some areas and shortages are expected. A more determined drive for higher wages could add another monkey wrench. Delays in new equipment deliveries because of heavy demand (CM&E May '55, page 22) may also add to contractor's scheduling problems.

Price Trends by States

The sharpest drop in highway prices during the first quarter came in Colorado where bids fell 8.3% below the fourth quarter of '54 and 5.7% under a year ago. This downward movement offset the rise which came during the second half of '54 and pulled the Colorado Index down to its lowest level in 6 years (see chart).

In California, highway prices declined 1.5% during the first quarter and were 5.1% below the first



On the Waldo Grade project, at the northern end of San Francisco's Golden Gate Bridge, Guy F. Atkinson Company contracted to move 1,500,000 cu. yd. of earth on some really tough grades.

To widen Rt. 101 to a six-lane highway a rocky hillside had to be cut away and the heavy material hauled half a mile down to the fill, in a deep ravine.

Those 20 per cent grades were like the side of a roof. But Atkinson's fleet of CAT* DW20 Tractors and No. 20 Scrapers got the job done. They hauled big loads down the steep slopes and switchbacks, then made their way to the top again after dumping. There have been few more convincing tests of the DW20's stamina and lugging power.

Eleven of the big wheel rigs were used on this $4,000,000 contract. Other Caterpillar equipment included D8 Tractors for push-loading and bulldozing, No. 12 Motor Graders to work on the haul roads and Caterpillar Diesel Engines powering compressors. Many successful contractors believe in standardizing on the big yellow machines—service and maintenance are simplified, parts are often interchangeable, and operators are familiar with the equipment. Caterpillar dependability, freedom from down time and long work life are clinching arguments for standardization.

Your Caterpillar Dealer will demonstrate the big production and low operating cost of the DW20 Tractors, and he'll back every machine he sells with on-the-job service and genuine Cat parts.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

quarter of '54. While the '55 prices were still slightly higher than the low second quarter of '54, they were the lowest for any first quarter since 1950. But, these cut-rate prices in California may not continue much longer, according to the State Highway Department. It expects highway prices to begin a steady rise in the near future because of increasing materials and labor costs.

The Texas Highway Department reported a 1.3% slide in bid prices between the fourth quarter of '54 and the first quarter of '55. Since then, its April monthly index shows prices climbed back to the fourth quarter '54 level. However, the April prices averaged 7.3% below April '54.

Prices bid on state highway jobs in Idaho have been riding a roller coaster during the last year. The chart shows how the bottom dropped out and prices tumbled by 32% during the second half of '54. Then came the first quarter of '55 and prices zoomed up by 43%.

Main reasons for the sharp drop in '54 bid prices, according to the Idaho State Highway Department, were: a record dollar volume of new work available; an attractive and well diversified program; keen competition as reflected by an average of 6.8 bidders per contract; and excellent weather with less than usual delineation between seasons.

The '55 rebound came because "when contractors have exhausted their ability and opportunity to absorb high labor and materials costs, they must adjust their prices upward, or go out of business."

Even with the big increase in '55, the Idaho Highway Price Index is the lowest for the first quarter since 1952 and is 5.1% below a year ago. The Department expects the index to remain at its current level or perhaps climb slightly during the months ahead in line with labor and materials cost increases.

Federal Aid Highway Prices Dip

The Bureau of Public Roads' U. S. Composite Mile Price Index shows a 0.4% dip in the first quarter of '55. This decline cut short a moderate upturn which seemed in the making late in '54 (see chart).

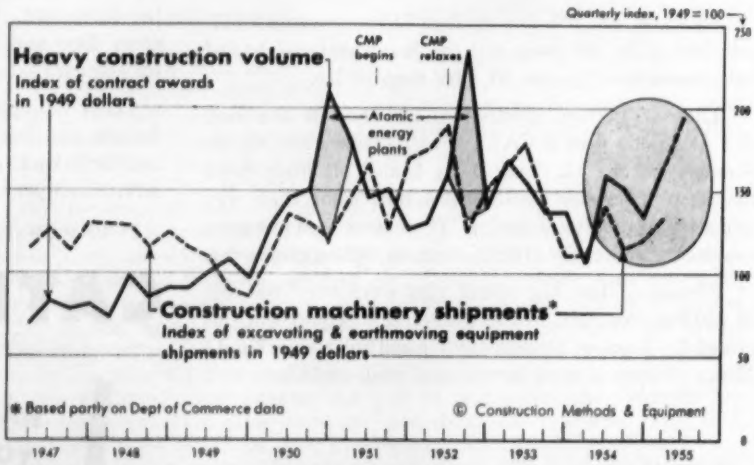
The '55 dip was caused by lower prices for concrete pavement, down 1.3%, reinforcing steel, down 1.7%, and structural steel off 0.6%. These declines offset a 1.1% rise in common excavation prices and a 1.5% increase in structural concrete.

Bid prices on federal-aid work are now only a split hair below the first quarter of '54. During the last 12 months, the BPR Index has been rather stable, moving within a narrow range of 149.2 (in terms of the original base 1925-29=100) in the third quarter of '54 and a high of 152.4 in the fourth quarter.

Ohio, New York Bids Well Below Estimates

Contractors bid below engineers' estimates on 12 of 16 jobs for which bids were taken May 10 by the Ohio State Highway Department. The $2.2 million low bid on one

(Continued on page 26)



HEAVY DEMAND FOR NEW CONSTRUCTION EQUIPMENT pushed first quarter '55 shipments 21% over the low volume a year ago and 11% above the fourth quarter of '54. The upturn follows the boom in heavy construction contracts which are breaking all records in '55.

You Can't Beat This Pair of Winners for LOW COST PRODUCTION

for your ¾ and 1-yard requirements

Marion 32-M ¾ cubic yard hoe

Marion 43-M, Heavy-Duty Dragline

Extra Profit Facts About The 32-M

- Fast, in-the-field conversion from hoe or shovel to crane, dragline, clamshell, pile driver.
- Large multiple disc type swing clutches give smooth, cool performance.
- Long, wide crawlers, location of deck machinery makes center of gravity far to the rear of the machine for extra stability.
- Independent worm type boom hoist powered up and down.
- Deck gears recessed in oil bath and anti-friction bearings help insure durability and reduce costly downtime.
- Torque converter for smooth operation (optional).

Extra Profit Facts About The 43-M

- Readily convertible as shovel, dragline, clamshell, crane, hoe and pile driver.
- Fast operation, easily controlled with Marion Air Control.
- Unsurpassed machine quality and dependability results from alloy steels, forgings and anti-friction bearings.
- Travels easily on carryall — no highway problems.
- More heavily built throughout than any machine of comparable rating.

Here are two machines engineered for your needs that will provide highly profitable production, economical operation with minimum maintenance for years to come.

Thousands of contractors are now enjoying the extra profit dividends of these job-proven performers — the MARION 32-M and 43-M. On top of the list of many extra benefits, facts prove they are producing really low cost production.

We'd welcome an inquiry and the opportunity to give you all the extra profit facts on these two heavyweight performers. See your nearest distributor today.

MARION • OSGOOD • GENERAL O-G

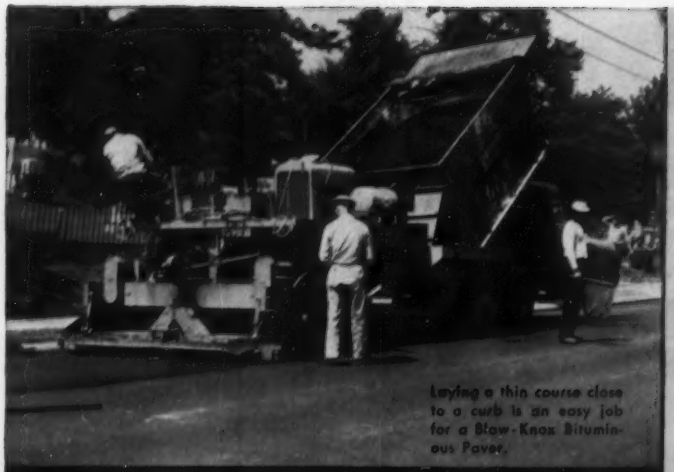
MARION POWER SHOVEL CO. • MARION, OHIO, U. S. A.

A Subsidiary of Merritt-Chapman & Scott Corporation

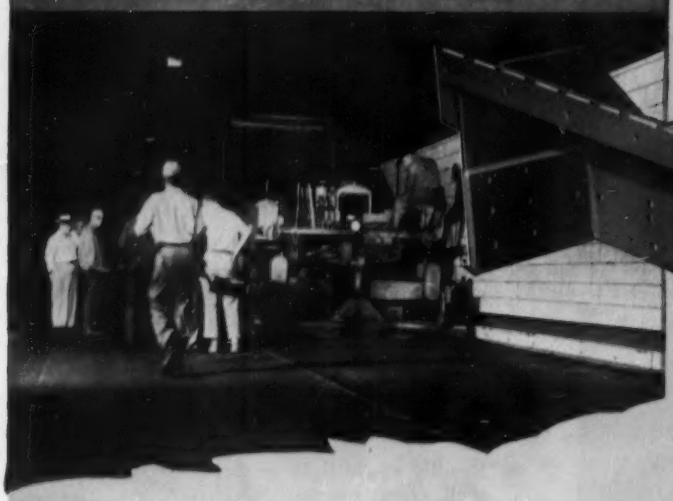
POWER SHOVELS FROM ½ TO 60 CUBIC YARDS
PILE DRIVERS • WALKING DRAGLINES

DRAGLINES • CLAMSHELLS • CRANES • BACKHOES
TRUCK CRANES • MOBILCRANES • LOG LOADERS

Your Confidence Is Justified Where This Flag Flies



Laying a thin course close to a curb is an easy job for a Blaw-Knox Bituminous Paver.



Here's a job that had to be done fast. The Liberty Tube in Pittsburgh, laid in two night shifts by the Harrison Construction Co.

On wheels it will pave for less

THAT business of completely rebuilding your Bituminous Finisher is a costly one. Take a look at the frame above. That is the backbone of the Blaw-Knox Bituminous Paver Finisher. Here is one big reason why you may *never* have to *rebuild your Blaw-Knox. No other Bituminous Finisher* has a Frame like this. Here is rugged construction that can take the road strains and the vibration necessary to make a Bituminous Paver deliver good results.

But, that isn't all. Road shock and machine vibrations that are in time destructive and cause wear in crawler equipment are readily absorbed by rubber-tired traction. Easy access to all parts for lubrication and adjustment makes upkeep easy and reduces the likelihood of maintenance being skimped.

If you are bidding on asphalt work you owe it to yourself to find out about the Blaw-Knox. Don't saddle yourself with continual rebuilding costs. Even if you have asphalt spreading equipment which you feel may be adequate you will cut your costs and increase profits by replacing it with the Blaw-Knox. Look over the advantages listed below and get all the details.

If you don't have these Bituminous Paver advantages you are losing money!

- *Wheel Steering* with long wheel base eliminates the over-steering of crawlers and assures greater accuracy, a smoother course and better joints.
- Wheel mounting eliminates the 600 to 700 parts characteristic of crawlers.
- Wheel mounting absorbs vibribation, reduces chatter in screed and wear and tear on machine.
- Dual Controls—handle machine from either side.
- Handles boxcar trucks with ease.
- Compacts to uniform density and automatically measures and levels.
- Long wheel base and leveling principle equalizes ordinary subgrade irregularities.
- Simpler, more easily adjusted crowning device.
- Easily tows to new location and gets back to lay parallel course in a fraction of the time required for crawlers. Reduces truck standing time.
- The only Bituminous Finisher with positive traction at *all times*.

OUTPRODUCES ANY OTHER ASPHALT FINISHER ON THE MARKET TODAY

IT'S YOUR BUSINESS . . .
Continued from page 22

job was 20.1% under the estimate. On another, the lowest of 11 bids ($453,321.71) was 31.6% below the estimate, while low bids on five other projects were 12% to 13% under estimates.

Tight competition on highway work in New York is evident from the results of 11 highway lettings on May 19. In this state, bids are not accepted unless they're below engineering estimates. However, the low bids ran below estimates by a wide margin—from 14% to 36%. Six of the 11 low bids were more than 20% under the estimates.

Plan for Financing Euclids Puts Accent on Flexibility

THE FINANCING FACILITIES of YMAC (Yellow Manufacturing Acceptance Corp.) are now extended to dealers and contractors purchasing earth-moving equipment manufactured by the Euclid Division of General Motors Corp. YMAC has had more than 30-years experience financing the sales of GMC trucks and coaches.

Details of the new financing plan took shape last October, about a year after the Euclid line became a member of the GM family. According to Harold Rowe, vice-president of YMAC, the principal feature of this program is the complete flexibility with which it operates, and applies equally to new or used Euclid equipment.

In general, the plan requires that a reasonable down payment be made, and the remaining portion of the sales price be paid in installments over periods ranging from 18 to 36 months. The purchaser's financial condition, credit rating, business prospects and past experience are among the factors which are given consideration in determining rates and terms. As previously mentioned, YMAC has made it possible for dealers to put the accent on flexibility. Each transaction is individually considered and tailored to meet the needs and abilities of the Euclid dealers and their purchasers.

The plan also permits a dealer to lease equipment to qualified contractors.

YMAC financing is available only through franchised Euclid and GMC truck dealers.

(Big Jobs of the Month on page 234)

ADC* Oilprint Analysis

CHECKS CRANKCASE OIL IN MINUTES

Shell Research gives you new oil-change yardstick—

Now—operators can test crankcase oil in the short time allotted for refueling and crankcase oil checks. The Shell ADC Oilprint Analysis gives a practical and accurate oil evaluation in minutes.

ADC Oilprint Analysis means big savings when used in your preventive maintenance program . . . gives valuable information on engine and oil conditions. It answers the question "When do I change my oil?" thus eliminating the draining of usable oil and the risk of using oils loaded with contaminants.

See for yourself how the new Shell ADC Oilprint Analysis can save you money in preventive maintenance. Let us show how you can use this new service for your equipment.

SAVES... Time, Money, Engines, Oil

*Trademark

SHELL OIL COMPANY,

50 WEST 50TH STREET, NEW YORK 20, NEW YORK
100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA

SHELL

Most Modern Trucks on

Chevrolet's handsome new Task-Force models answer your job needs with the most modern design and engineering features the trucking industry has ever seen.

Styling that speaks for itself—and speaks well of you and your business! Styling that catches the eye and serves as an on-the-job advertisement! You'll notice *two* distinctively different design treatments are offered—one in light- and medium-duty models, the other in heavy-duty jobs. It's functional styling, too. The new panoramic windshield adds to all-over design appeal—and inside it's even *better looking*—with a wider, safer view of the road. Chevrolet's new Safety Step running board is *concealed* and stays free of snow, ice or mud. Drivers will especially like the broader, softer seats; the High-Level ventilating system that takes in outside air in all kinds of weather.

CHEVROLET

NEW CHEVROLET

Any Construction Job!

High-Voltage power saves on operating costs—saves time, too. All six new Task-Force engines are sparked by a husky new 12-volt electrical system. That means snap-of-the-finger starting even in cold weather, and boosted generator capacity. The high-compression power of these great valve-in-head engines keeps you running longer between gas stops.

Anything else? Plenty. Capacities go all the way up to 18,000 lb. G.V.W.—available in 2-ton models. Enough G.V.W. for practically any job! Frames are new—of 34-inch standard width to accommodate special bodies, and with more rigid, completely parallel side members. And there's new suspension, front and rear, to make the road a lot easier on the load.

Tubeless tires are included on ½-ton models at no extra cost. Power Brakes are standard on 2-ton models, optional at extra cost on others. All models except Forward-Control are available with Power Steering as an extra-cost option. New Overdrive is now available on ½-ton models, optional at extra cost; Hydra-Matic, on ½-, ¾- and 1-ton models. There's more still, but call your Chevrolet dealer for complete details. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

Task-Force TRUCKS

ENGINEERED ESPECIALLY FOR TOUGH CONSTRUCTION DUTIES

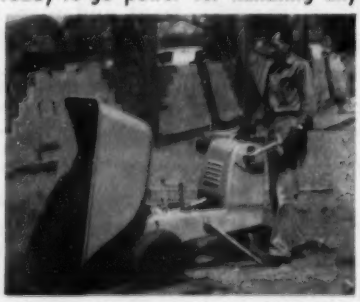
performs on-the-job handling - faster - better - easier!

This new Prime-Mover built specifically for construction work provides practical answers to building contractors problems.

FOR EXAMPLE:

1. **Length of only 64 inches and 31½ inch width permit easy maneuverability where more cumbersome equipment cannot go.**
2. **Compact size allows operation over the same ramps, runways, hoists and towers commonly used.**
3. **Positive controls let even the inexperienced laborer operate the unit safely and efficiently.**
4. **Interchangeable bucket and flatbed increases cost-saving usefulness.**
5. **Dependable engine and proved transmission insure continuous service.**
6. **Recoil starter, large fuel tank, sealed-in lubrication, natural position steering bars, are added improvements.**

These features and improvements mean a Prime-Mover that gives you ready-to-go power for handling any material — anywhere on the job. Prime-Mover distributors are ready to demonstrate. See yours or write us



A Prime-Mover will place 12 to 17 cubic yards of concrete per hour. 10 cubic feet per trip.

A Prime-Mover will haul up to 300 bricks direct from yard to bricklayer. 1500 lbs. per trip, up 20% grades.

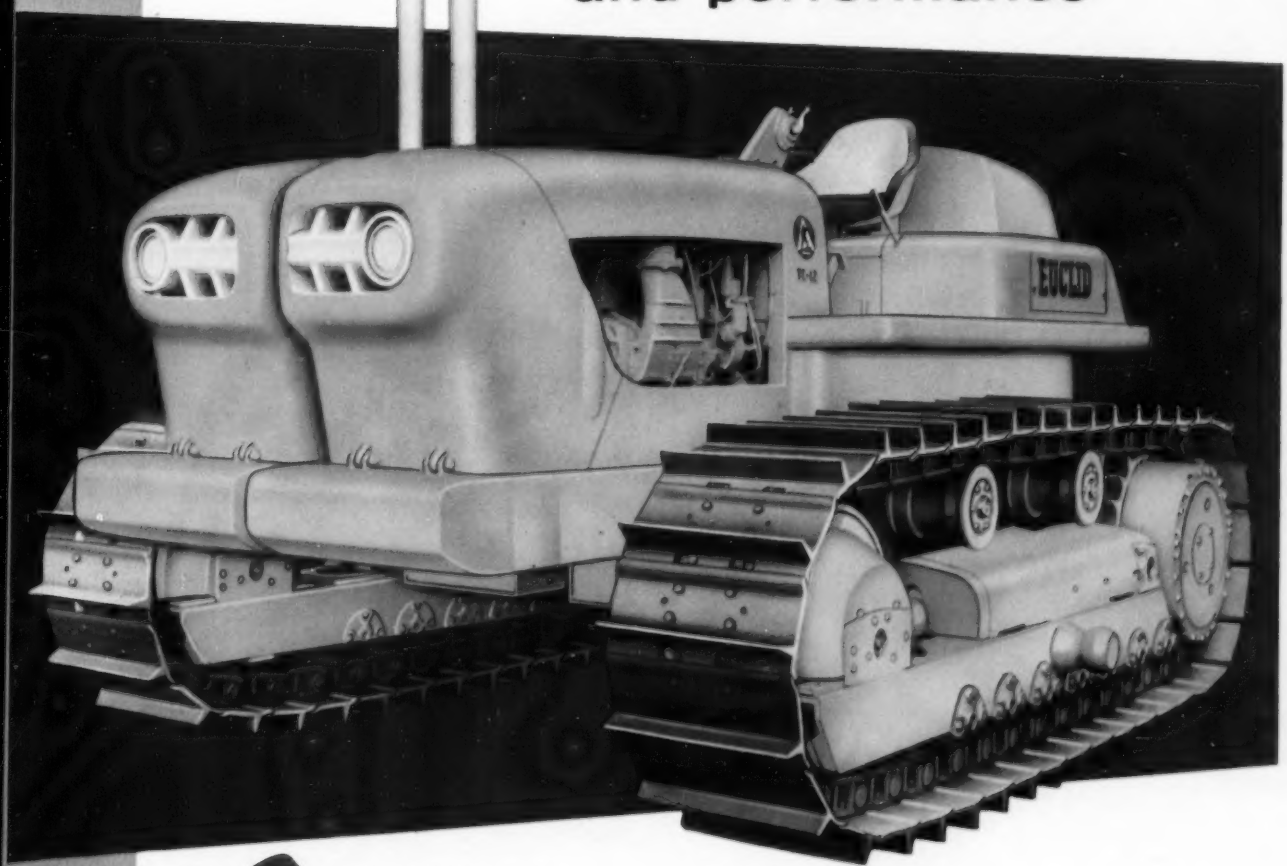
PRIME-MOVER

THE PRIME-MOVER CO., MUSCATINE, IOWA

Euclid TC-12

TWIN CRAWLER

COMPLETELY NEW
...in design and performance



2 ENGINES...with Separate Torqmatic Drives...total of 388 horsepower

Euclid, a pioneer in the development of specialized equipment for moving large tonnages in off-the-highway service, announces the TC-12 . . . the first really new crawler tractor in years. It's a new concept of tractor work-ability . . . smooth performance . . . unequalled power . . . ease of operation and maintenance.

Features that give the "EUC" TC-12

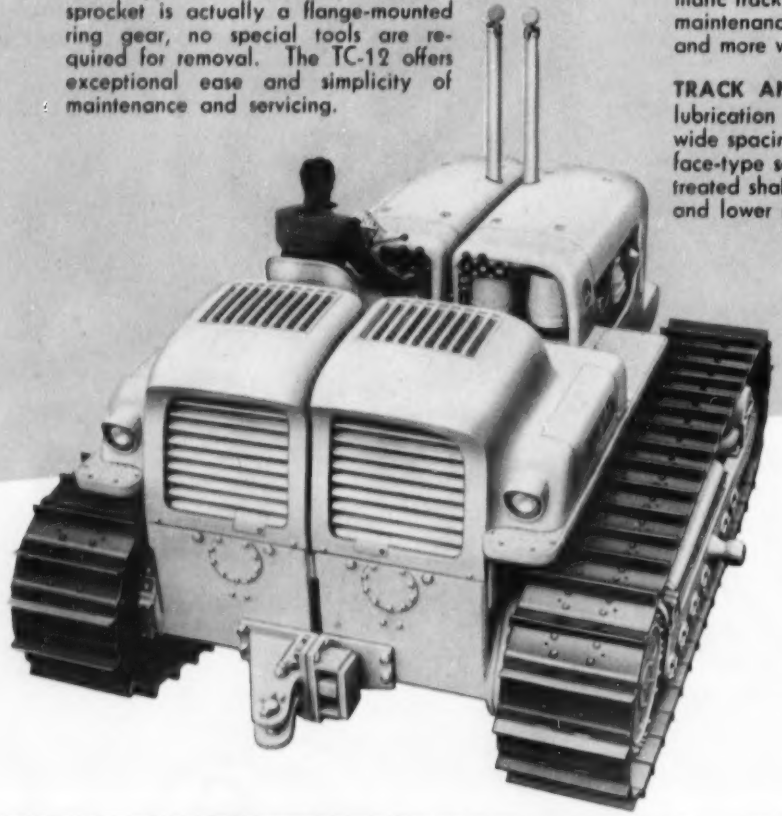
Here, for the first time, is a completely new tractor that's designed and built to provide all the features you want in a crawler tractor. It is years ahead of the field in ability to get more work done—faster—because it's unequalled for power, smooth operation, speed and maneuverability.

Powered by two 194 h.p. diesels with separate Torqmatic Drives for each track, the TC-12 provides a smooth, steady flow of power to meet job requirements. Unique design permits track oscillation for maximum traction on rough, uneven ground. Three speed ranges—both forward and reverse—give any speed up to 8.3 m.p.h.

ACCESSIBILITY for servicing of all major components is unequalled in any other crawler. Unitized assemblies are all easy to get at . . . they can be disconnected, serviced or removed without tearing down other parts. All lubrication fittings, check points, etc., are located for maximum convenience. Fuel tanks have ample capacity for full shift operation.

EASE OF OPERATION is a feature of the TC-12's modern design. The operator has ample room for maximum comfort and unusually good visibility at all times. Torqmatic Drive and independently powered tracks make the tractor easy to operate . . . there's no clutch or manual shifting of gears.

PLANETARY DRIVE is of the same design that has been performance proved in thousands of "Eucs." It can be serviced or replaced without removing the track assembly, frame or drive sprocket. Since the drive sprocket is actually a flange-mounted ring gear, no special tools are required for removal. The TC-12 offers exceptional ease and simplicity of maintenance and servicing.



TRACK OSCILLATION—Twin-Power design, with each half of the tractor separate and connected by only one big transverse shaft, gives the TC-12 maximum stability and traction on rough ground. Each half of the tractor, not just the tracks, can move up or down to maintain better ground contact. Where size or weight restrictions for shipping require, the tractor can be separated into two halves in a very short time.

HYDRAULIC TRACK TENSION—Maintaining proper track tension, a difficult and costly problem with other crawlers, is automatic on the TC-12. Euclid's track tensioning system consists of a hydraulic jack that maintains uniform pressure on the front idler. An accumulator absorbs recoil caused by stones, etc., passing between the drive sprocket and track. Automatic track tension is a feature that pays off in lower maintenance and longer track life . . . less downtime and more work time.

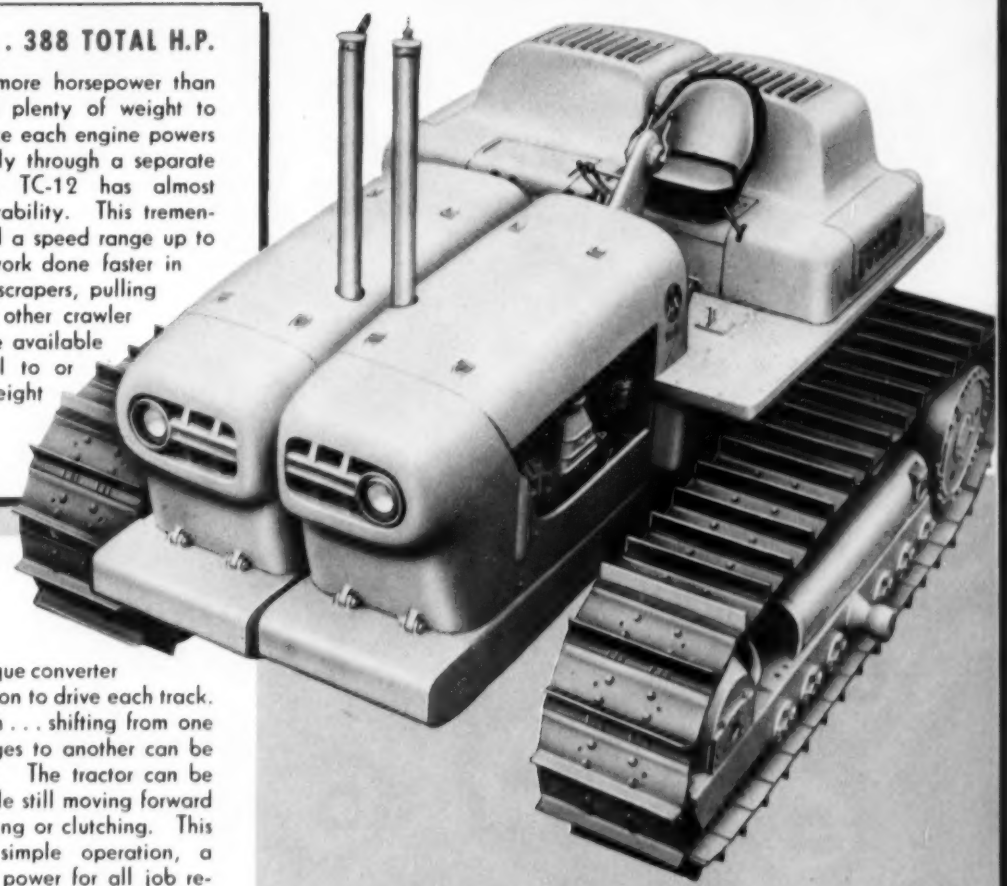
TRACK AND CARRIER ROLLERS have 1000 hour lubrication . . . heavy duty barrel type bearings with wide spacing for maximum support and self adjusting face-type seals to exclude water and dirt . . . heat treated shaft and rollers are integral unit for long life and lower maintenance.

COOLING SYSTEM problems that are common to other tractors are eliminated in the TC-12 due to the rear location of the radiators where there is no obstruction for an ample flow of clean air. More efficient engine operating temperatures can be maintained . . . and with the hinged radiator hoods, replacement of a fan belt is a simple matter, not a major disassembly job.

MORE WORK-ABILITY THAN ANY OTHER CRAWLER

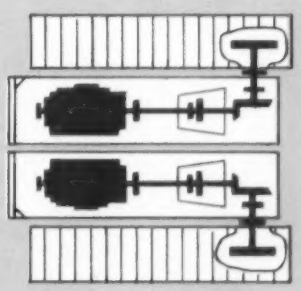
TWIN ENGINES . . . 388 TOTAL H.P.

The TC-12 has much more horsepower than any other tractor and plenty of weight to utilize this power. Since each engine powers one track independently through a separate Torqmatic Drive, the TC-12 has almost unbelievable maneuverability. This tremendous usable power and a speed range up to 8.3 m.p.h. gets more work done faster in dozing, push loading scrapers, pulling cable scrapers or any other crawler drawn equipment. The available drawbar pull is equal to or greater than the gross weight of the tractor and attachments.



TORQMATIC DRIVES

Back of each 194 h.p. engine is an Allison torque converter and torqmatic transmission to drive each track. There is no master clutch . . . shifting from one of the three speed ranges to another can be done under full power. The tractor can be shifted into reverse while still moving forward . . . no delay for stopping or clutching. This power train provides simple operation, a smooth steady flow of power for all job requirements, and develops greater drawbar pull at faster ground speed . . . all important for work with rubber-tired motor scrapers.



Twin-Power — using two engines with separate Torqmatic Drives

INDEPENDENT TRACK DRIVES

With a separate power train for each track, the TC-12 has faster and easier steering with greater flexibility than any previous tractor design. Steering is accomplished by putting either one of the transmissions in neutral and using the track steering brake. Tight pivots can be made by reversing one transmission and keeping the other one in forward speed. Operator has "hair trigger" control of steering at all times in any of the three speed ranges, forward or reverse.

SPECIFICATIONS

Total h.p.—388 h.p. at rated speed.
Speeds — 3 speed ranges, forward and reverse to 8.3 m.p.h.
Drawbar pull (bare tractor)—forward and reverse 54,000 lbs. low range
53,500 lbs. intermediate
53,000 lbs. high
Track width (standard shoe) . . . 26"

Track gauge	110"
Overall width	11' 4"
Overall length	16' 2"
Height (excluding stacks)	7' 11"
Drawbar height	23"
Ground clearance	20"
Operating weight (bare)	approx. 58,000 lbs.

The "EUC" TC-12

...a new concept in *Speed* and *Power!*

With two engines providing a total of 388 h.p. and separate Torqmatic Drives for each crawler track, the TC-12 has no equal for smooth performance, ease of operation and work-ability on any crawler tractor job. It's a completely new tractor with ease of servicing and maintenance that means lower costs and better profits to owners in every field.

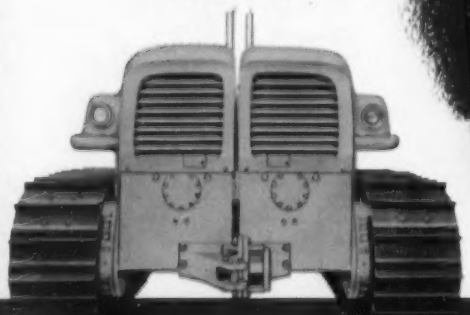
Scrapers are loaded in a higher gear with the TC-12 because of Torqmatic Drive that matches any speed.

Higher working speeds no matter how big the loa

Ease of operation and high travel speeds save time on every job.

Power and traction for the toughest jobs and top travel speed of 8.3 m.p.h.

Rear mounted radiators maintain efficient engine operating temperatures.



For pulling big equipment, the smooth flow of tremendous power maintains steady production.

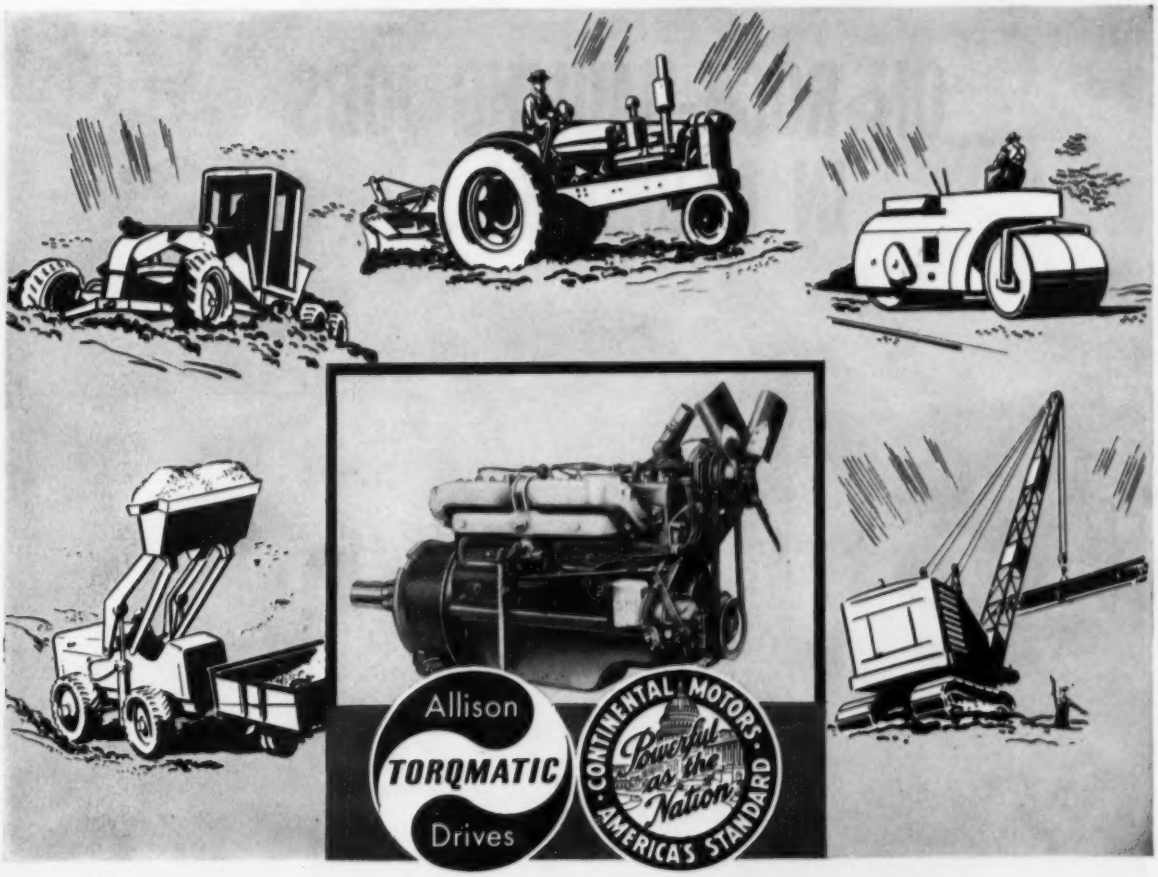
GM GENERAL MOTORS

EUCLID

EUCLID DIVISION

GENERAL MOTORS CORPORATION

Cleveland 17, Ohio



This Team

gets more work from less horsepower

YOU CAN GET an Allison TORQMATIC Converter matched to a Continental RED SEAL gasoline engine in a wide range of hard-working equipment.

When you do you'll get shock-free power that cuts costs all along the driveline—that keeps your equipment on the job building profits, not in the shop raising costs.

The TORQMATIC-RED SEAL team helps manufacturers reduce horsepower with no loss in equipment work-ratings. That's because the TORQMATIC Converter can *triple* engine torque—helps a lower-horsepower engine deliver higher *working* power.

And it automatically balances engine output with load demand to boost working speed and engine efficiency—increases engine life and cuts maintenance costs by keeping the engine in its most efficient operating range at all times.

Allison's newest TORQMATIC Converter is easy to install and maintain. It is completely self-contained, requires no complicated piping or other connections. It has a built-in pump and oil cooler, carries its own oil supply, has a simple dip-stick to check oil level.

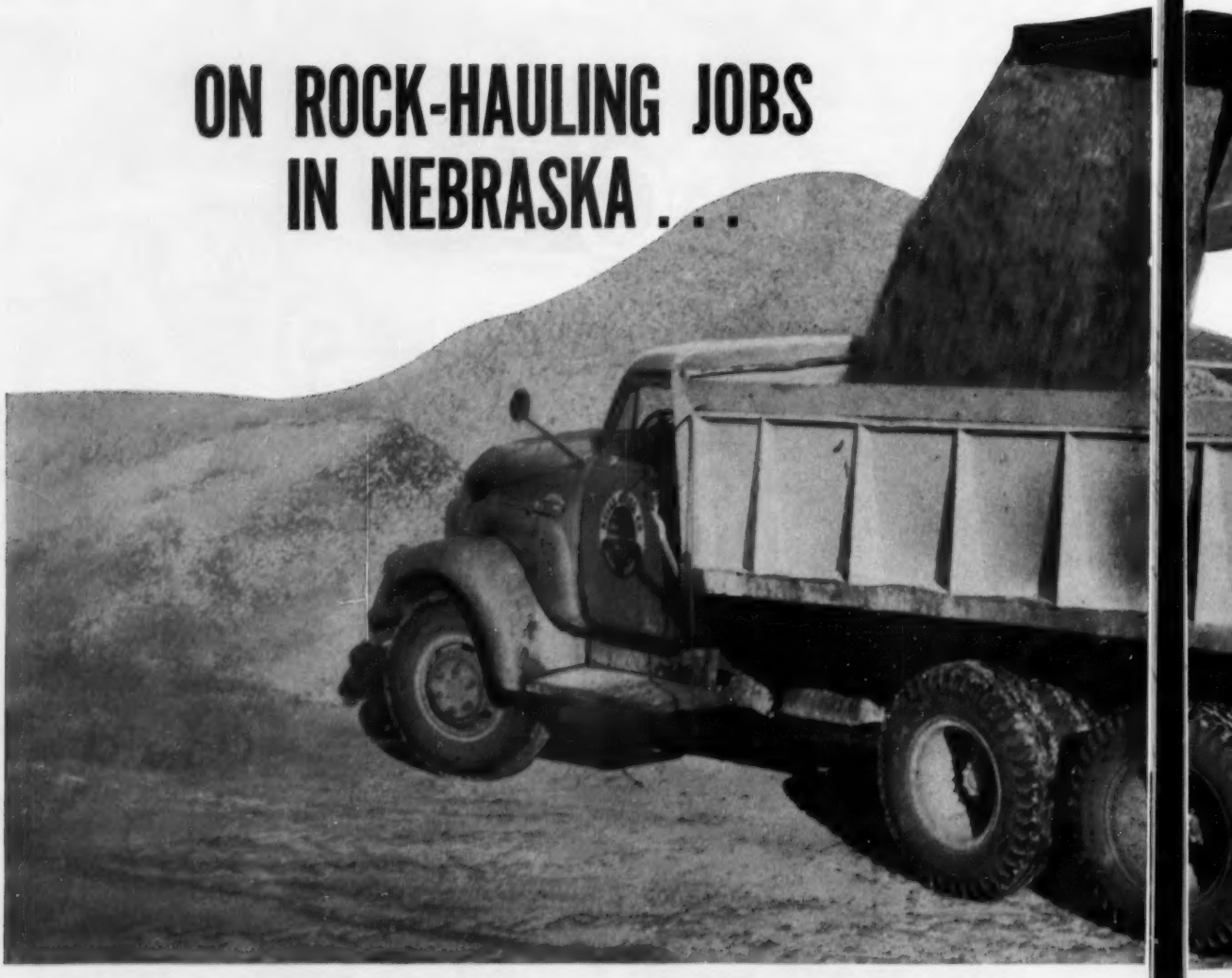
You can get an Allison TORQMATIC Converter matched to gasoline or Diesel engines from 40 to 400 horsepower—a TORQMATIC Transmission for engines up to 300 horsepower. Ask your equipment dealer or manufacturer about Allison TORQMATIC DRIVES next time you buy—or write Allison Division of General Motors, Box 894T, Indianapolis 6, Indiana, for more details.

GM TORQMATIC

Allison

TORQMATIC DRIVES

ON ROCK-HAULING JOBS IN NEBRASKA . . .



"NYLON CORDS CUT OUR ROAD DELAYS

says ALVIN W. KELLY,

General Manager, Kelly Bros. & Co., Omaha, Nebraska

"From the limestone quarry in Nebraska we haul rock for delivery throughout central and eastern Nebraska. This operation involves both truck and rail to move the crushed rock, riprap, wall stone and agricultural lime we produce. We fill up our trucks with 20-ton gross loads and roll them over all kinds of roads—gravel, oiled gravel, rock, concrete and macadam—through all kinds of weather. Naturally, road delays are one of the biggest threats to the number of deliveries we make and the schedule we maintain. With ordinary tires we've had about two road delays a day due to tire trouble.

"Then we tried our first nylon cord tires in January 1954. We put them on

YOU'LL FIND NYLON IN PASSENGER-CAR TIRES, TOO! Shock-absorbing nylon cords mean extra protection against blowouts . . . greater safety on any road.

DUE TO TIRE TROUBLE 50-75%"

all the rear-drive wheels. Our records show that we can expect to get 100,000 miles on the nylons' original tread. But, best of all, nylons have cut time-consuming road delays due to tire trouble 50 to 75%."

For ten years Du Pont and leading tire manufacturers have been working together to perfect nylon cord truck tires. Now actual road experience proves nylon to be the best protection yet against tire failure. Truck users' reports show nylon cord tires mean fewer road delays, more mileage, more recaps—lower cost per mile.

Nylon has greater tensile strength, flex and abrasion resistance than any other cord used in tires. Nylon virtually ends cord ruptures caused by bruise breaks. Moisture seeping through cuts doesn't damage nylon. Nylon can take the hottest road temperatures you'll ever encounter in normal operations.

Prove to yourself that nylon cord truck tires give substantially lower cost per mile. Ask your dealer about nylon cord truck tires today. (Du Pont makes the tough nylon yarns, does not produce tires.)

DU PONT NYLON FOR TIRE CORD

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REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
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FREE BOOKLET on nylon tires—write for your copy. Textile Fibers Dept., Room 11506, E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Del.

Pickin' Em Up and Layin' Em Down

ENGINEERS AND CONTRACTORS R. H. Fulton & Co., laying 24 mi of 30-in. pipe for Panhandle Eastern Pipe Line Co. in Kansas are giving the new Cat 583 Pipelayer a good test. On the lowering-in operation, the contractor, using the 86-in. gage 7-roller track frame tractor, replaced three sidebooms and made 2 mi per day. On level ground the unit with its split counterweight arrangement supported 700 to 800 ft of pipe. To handle the 10,000-lb doping machine, a double tree was fabricated and attached to two sets of six-wheeled cradles. On lowering and doping operations, loads were carried 7 ft from the outside tractor rail to center of ditch. The job took four weeks to complete.

We proudly open our **ATLANTA OFFICE**

A SPECIALIZED SERVICE . . . SPECIALIZING IN SERVICE

Now you can count on even better local service for the growing needs of Southeastern Industry as we open our sixth district office and warehouse. In charge will be men who know the needs of this territory, through years of service in the area. If you use any of our specialty products pictured above, we know you will welcome the usual Foster dependability and the convenience of 'single-source' buying.

The 52-year old Foster company is the nation's foremost warehouser of New and Relaying Rails, the largest specialist in Rental Steel-Sheet Piling, and one of the country's most dependable sources for Pipe, in all sizes—from warehouse and mill.

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805 PEACHTREE STREET

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L. B. FOSTER CO.

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How Link-Belt Speeder engineering helps both the shovel-crane and the operator

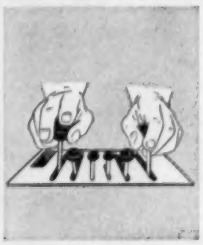
increase earning capacity!

LS-98 with 60′ boom and 1¼ yard bucket works in sand and gravel pit.

You're ahead on every job —Link-Belt Speeders—whether crawler or rubber-tired—are years ahead of the shovel-crane industry. Only Link-Belt Speeder offers you Speed-o-Matic—the true power hydraulic fingertip control system. Only Link-Belt Speeder offers you so many outstanding design, construction and operator advantages. For facts on every machine in the ½ to 3-yd, 10 to 60-ton work range—contact your Link-Belt Speeder distributor or write Link-Belt Speeder Corporation, Cedar Rapids, Iowa.

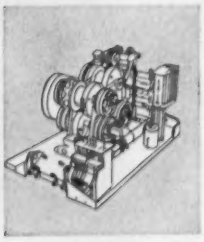
13.048

Two-way speed increase



● Speed-o-Matic, the true power hydraulic control, provides fast, easy, smooth response . . . ideal control *for speed with accuracy*. It's also engineered to *reduce operator fatigue* — enables him to maintain greater output with less effort.

Extra power, stamina



● Anti-friction bearings, splined shafts and precision-machined surfaces at every important point convert more *rated* hp into actual line pull. All-welded, stress-relieved construction permits use of extra power.

More work-time

● Speed-o-Matic reduces operator fatigue, losses due to end-of-the-shift letdown. Further, it minimizes downtime. For example, Speed-o-Matic clutch is hydraulic actuated, self-compensating. Eliminates frequent stops for adjustment.

A demonstration can be arranged to suit your convenience. See one of these great machines in action and judge for yourself why they are today's most advanced shovel-cranes.

LINK-BELT SPEEDER

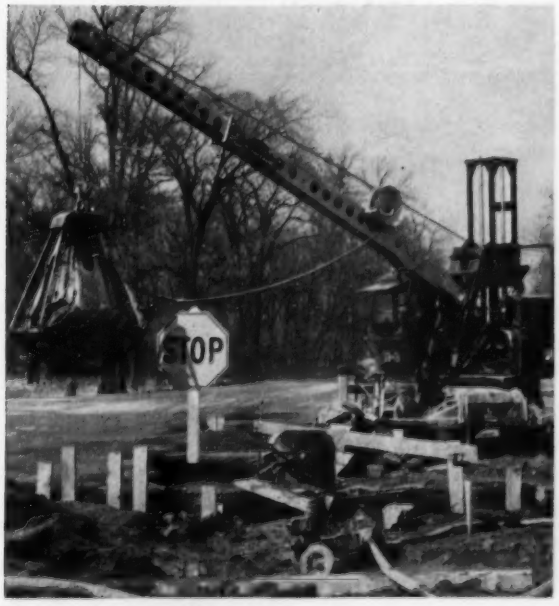
Builders of a complete line of crawler and rubber-tired shovel-cranes

Construction News in Pictures...

ADJUSTABLE TOWER LIGHTS—This portable light tower was built by Connecticut Terminal Co., Inc., New London, Conn. Usually it operates at ground level but occasionally gets high level treatment from a Clark-Ross fork truck, for broader illumination.

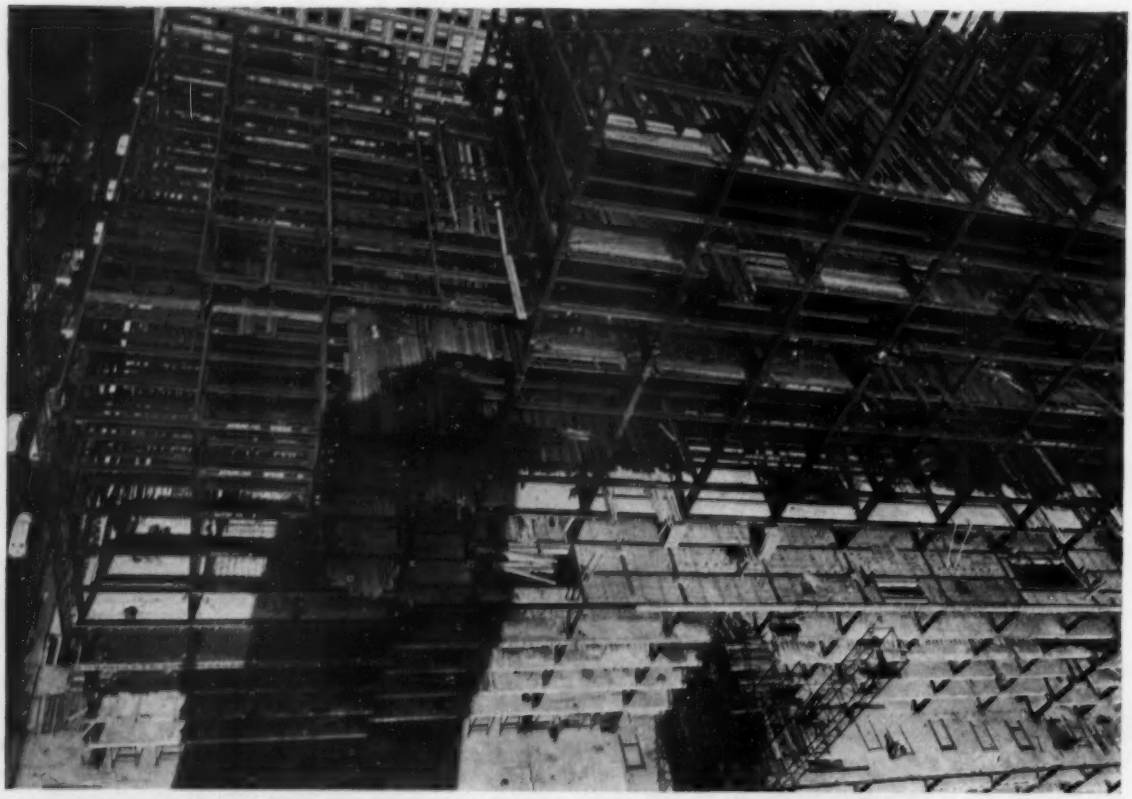
TRACTOR LIFTS TRACTOR—Here's a slightly different twist. If you look closely you'll see an International TD-6 air-borne 8,000-lb tractor cradled in the arms of the Drott material-handling rack, made specially for the Marine Corps, on a TD-18A.

(More photos on next page)

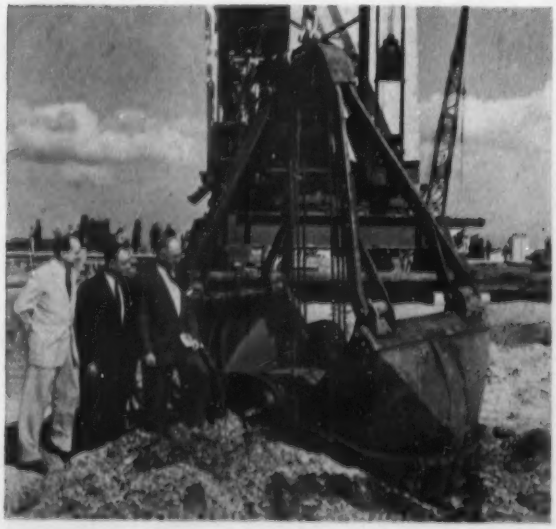


STOP FOR THIS ONE—The arterial sign seems to tell the story of this backfilling trenching operation by Temasini Contractors, Inc., Milwaukee, Wis. The Bucyrus-Erie Hydrocrane is equipped with a recently developed dual-ram clamshell bucket.

TIE-BAR PLACER—Rig developed by Koss Construction Co., Topeka, Kan., automatically sets tie bars at correct depth and spacing in slab, eliminating bar supports and much labor. Placed in disks that turn as spreader moves, bars "drop off" into place.



JUNGLE OF STEEL—Steel framework for the Socony-Vacuum building in New York is half-way up—past the 21st floor of the 42-story skyscraper. U. S. Steel's American Bridge Division has already set in place 14,700 tons of steel, with 5,300 tons to go, for the block-square structure. Turner Construction Co. is the general contractor and Harrison & Abramovitz the architect.



FIRST BUCKETFUL—The $65,000,000 Mississippi River bridge at New Orleans gets started as dignitaries watch Dravo Corp.'s whirler with Owen clam take first bite. The bridge, a cantilever structure, will have 1,575-ft center span, longest in the U. S.

ARCH CENTERING—Adjustable Hico segmental steel girders cut form-erection time for Ragnar Benson Inc., Pittsburgh, on construction of 26x60-ft igloos. Nailers wired to girders hold plywood forms, and all but centerline shoring is eliminated.

ALLIS-CHALMERS

HD-21 and HD-16

with Torque Converter* Drive

***and the Torque Converter is Twin Disc**

Since 1937, Twin Disc Clutch Company has specialized in Torque Converter Drive for powered industrial equipment. Crawler tractors represent one of the most successful applications.

By applying the crawler tractor's horsepower and torque through the cushioned drive of fluid, Torque Converter Drive permits peak utilization of horsepower and prevents engine lugging—provides smoother, easier, more flexible operation with minimum clutching and shifting—promotes faster work cycles and more production per day.

TWIN DISC

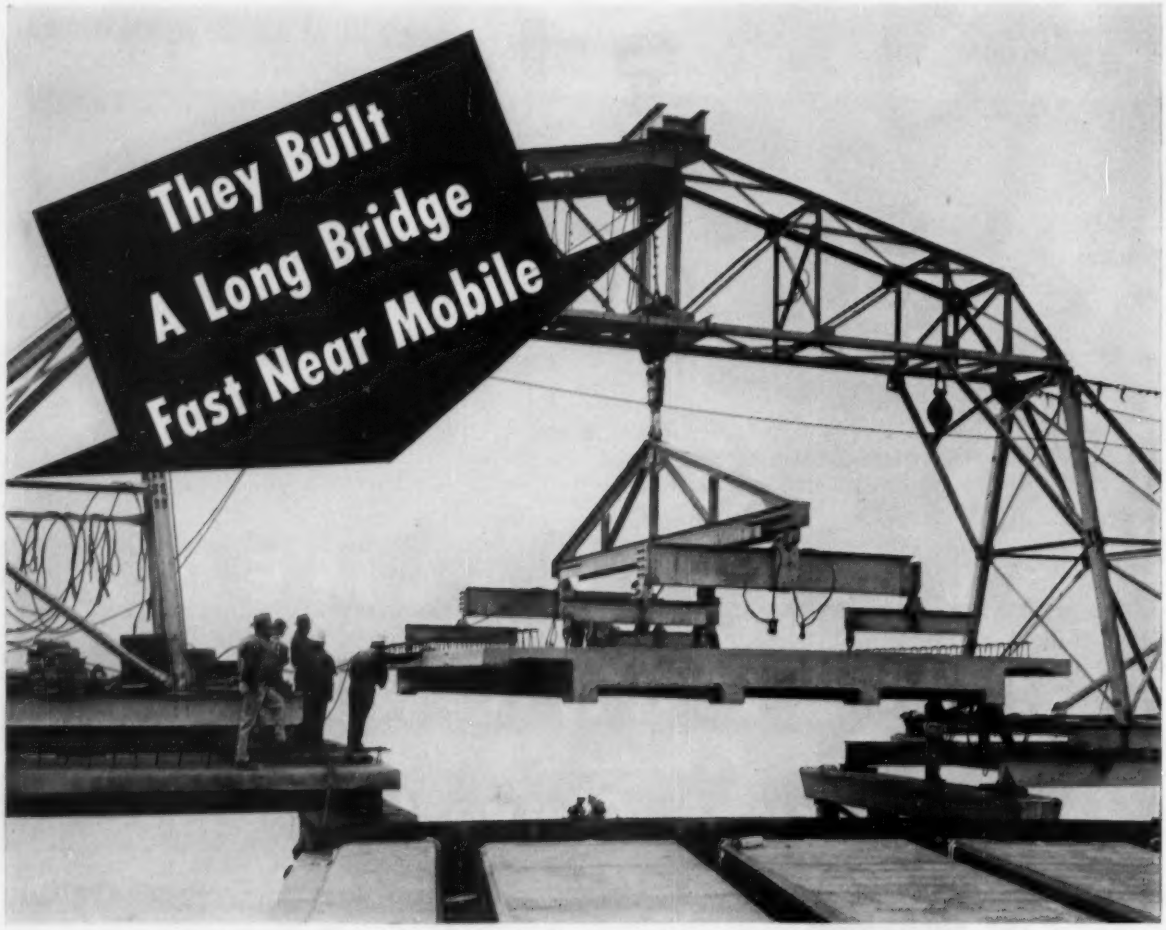
TWIN DISC
Torque Converters

Twin Disc Clutch Company, Racine, Wisconsin
Hydraulic Division, Rockford, Illinois

The new Allis-Chalmers HD-21 and HD-16 Crawler Tractors are designed and built to meet extremely high performance requirements — while maintaining the rigid Allis-Chalmers standard for longer life and the ability to operate at low cost.

Many outstanding features are being introduced by Allis-Chalmers on the HD-21 and HD-16, including • all-new A-C Diesel engines with "follow-through" combustion, for greater work with low loading of engine parts and extra long overall engine life • new Tru-Dimension track, featuring greater weight and maximum toughness • new "Wrap-around" radiator guard which tilts forward and down for easy accessibility • *Twin Disc Torque Converter Drive as standard equipment on the HD-21; optional equipment on the HD-16 . . . designed by Twin Disc and Allis-Chalmers engineers to meet exclusive requirements of the HD-21 and HD-16.*

Twin Disc Torque Converter Drive was also standard equipment on the HD-21's predecessors . . . for since 1940, it has been a feature on A-C Crawler Tractors.



Blount Bros. Construction Co., Montgomery, Ala., and Kansas City Bridge Co., Kansas City, Mo., joint contractors. Concrete Pouring by Radcliff Gravel Co., Mobile, Ala.

Roadway Cast in Ingenious Irvington Forms

The new Dauphin Island Bridge extends more than two miles over the choppy, wind-swept mouth of Mobile Bay. The roadway problem of the contractors was how to lay the concrete rapidly and economically. Pour in place or cast slabs on shore?

The solution was something different. They called in Irvington engineers who designed and built accurate and quick-working forms, mounted on barges. Pouring was done at the Mobile waterfront... the 65-ton 29′ x 34′ slabs were hoisted into place at the bridge site. The job progressed in eye-opening time.

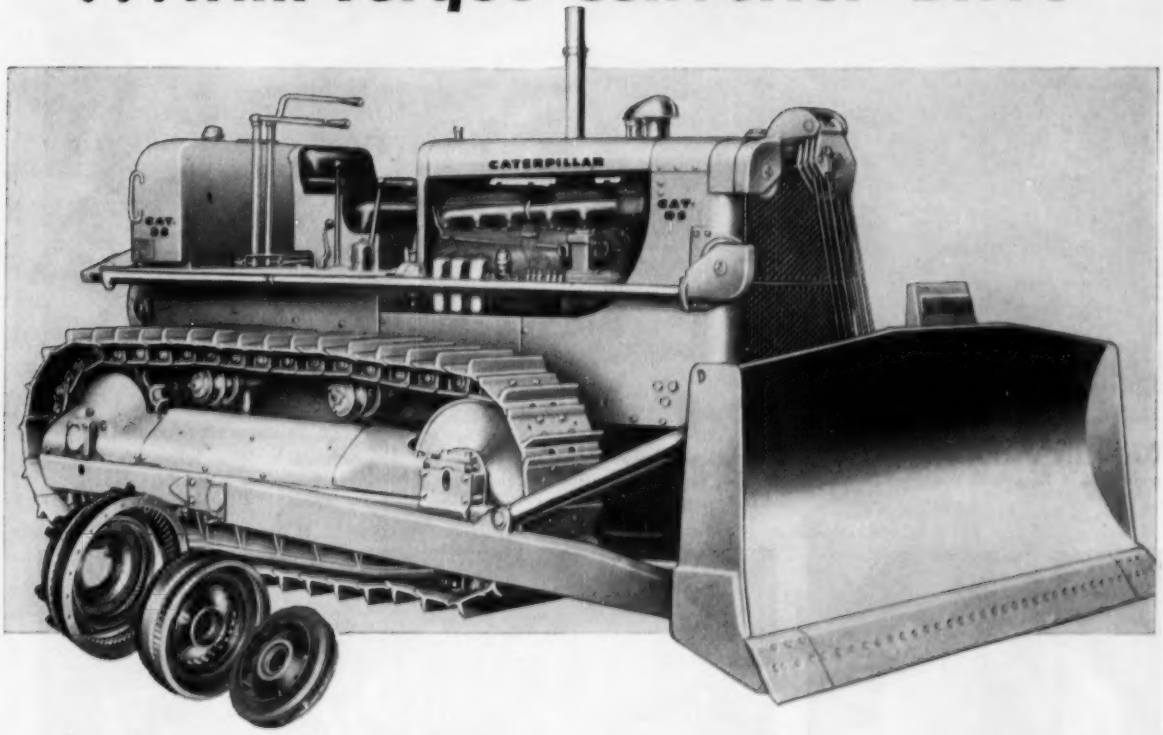
Let Irvington ingenuity, ideas and experience simplify your concrete forming problems. Get in touch with us without obligation.

IRVINGTON FORM & TANK CORPORATION

DEPARTMENT CMC, 20 VESEY STREET, NEW YORK 7, N. Y.

2 NEW CAT DIESEL TRACTORS D8 and D9

. . . with Torque Converter* Drive



***and the Torque Converter is Twin Disc**

Since 1937, Twin Disc Clutch Company has specialized in Torque Converter Drive for powered industrial equipment. Crawler tractors represent one of the most successful applications.

By applying the crawler tractor's horsepower and torque through the cushioned drive of fluid, Torque Converter Drive permits peak utilization of horsepower —provides smoother, easier, more flexible operation with minimum clutching and shifting—promotes faster work cycles and more production per day.

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES

TWIN DISC
Torque Converters

Twin Disc Clutch Company, Racine, Wisconsin
Hydraulic Division, Rockford, Illinois

The new Caterpillar D8 and D9 Diesel Tractors are built to deliver an even higher standard of money-making production, on *any* track-type application in *any* field.

Many advance-design features are engineered into these powerful Cat-built machines, including new Cat Diesel Engines with an all-new fuel injection system; new 7-roller track frames for maximum stability, flotation, and better ride; new "Water-quenched" track shoes for longer life than ever before; Hydraulic Booster Steering for maximum steering ease; new starting engines with more power; "In-seat" starting for greater convenience . . . *and Twin Disc Torque Converter Drive as optional equipment on both the Cat D8 and D9 Diesel Tractors . . . developed by Twin Disc and Caterpillar engineers to match the precise power characteristics of the new D8 and D9.*

CONSTRUCTION 'ROUND THE WORLD

DAM IN JAPAN—A new electric power program is well under way in Japan with a number of major dams being constructed. This Bucyrus-Erie 54-B with concrete bucket is helping to construct the Tagokura Dam in Fukushima Prefecture in Northern Japan.

HAND LABORER—The machine age apparently has not arrived in all parts of the world. This 75-yr-old immigrant can still do a day's work. He is one of a crew building a new highway connecting Jerusalem with Judaean hills, in Israel. (Wide World)

BRIDGE SUPERINTENDENTS—In far off Algeria the sight of a Caterpillar D6 bulldozer-equipped tractor can attract quite a number of onlookers. This one is removing excess silt caused by heavy spring rains from the bed of the Bou Arfa River.

INTERNATIONAL TD-24

with Torque Converter* Drive

For the largest earthmoving projects . . . for laying big pipe faster and surer . . . for attaining new highs in logging production . . . I-H has developed the new INTERNATIONAL TD-24 Torque Converter Crawler Tractor.

Among the many features offered in the new TD-24 are *finger-tip hydraulic control* with INTERNATIONAL's famous Planet Power Steering; *instantaneous high-low range shift,* with all transmission shifting done by just *one* gear shift lever; the exclusive *"Decelerator"* feature, which gives the operator complete control of engine speed at all times; and *Twin Disc Torque Converter Drive* as *optional equipment . . . tailored by Twin Disc and International engineers to the TD-24's exact characteristics.* TWIN DISC CLUTCH COMPANY, Racine, Wisconsin; Hydraulic Division, Rockford, Illinois.

***and the Torque Converter is Twin Disc**

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TWIN DISC

TWIN DISC
Torque Converters

Unique use of LACLEDE STEEL JOISTS

saves building time and cost for new Missouri high school

PACIFIC HIGH SCHOOL
Pacific, Mo.

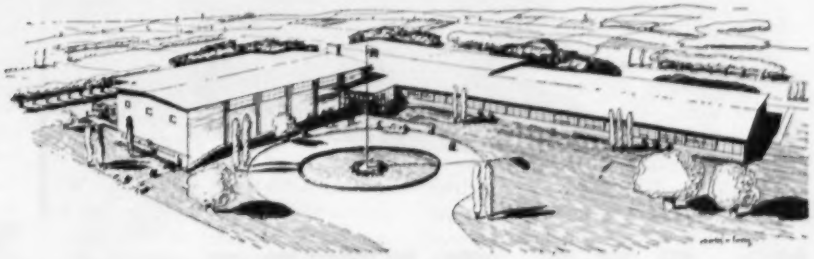
Contractor:
Juengel Construction Co., St. Louis

Architect:
Charles Lorenz, Kirkwood, Mo.

The new Pacific High School provides an excellent demonstration of the versatility of Laclede Straight Chord Steel Joists and their adaptability to specific architectural requirements.

By using two single joists with cantilever extended ends on each side of a three bay roof design, the number of joists required on the project was reduced by one-third and substantial saving resulted in material, time and labor.

Other Laclede Steels, too, including Multi-Rib Reinforcing Bars and Welded Wire Fabric, were used in this modern new building.



LACLEDE

LACLEDE STEEL COMPANY

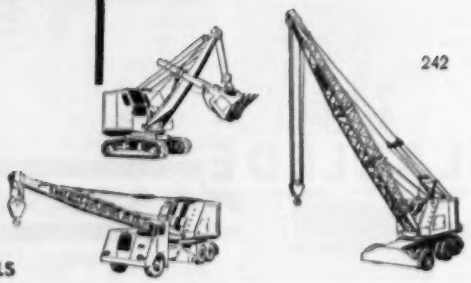
SAINT LOUIS, MISSOURI ◆ Producers of Steel for Industry and Construction

big 1½ yard BAY CITY ...ideal for tough rock work

In road building and other tough jobs, Bay City Shovels are proving their honest dependability day after day. For instance, below is a new model #70, working for the Essex Sand and Gravel Company at Peabody, Massachusetts. This low-weight, low-price #70, rugged enough for quarry work, will handle any excavating job. Powered by Cummins Diesel with hydraulic coupling, the #70 as a shovel weighs 44 tons and is equipped with 23 ft. boom, 18 ft. sticks, and a 1½ yard rock-type dipper. Let us tell you more about this fully convertible shovel-crane which is available with standard or long crawlers. BAY CITY SHOVELS, INC., Bay City, Michigan.

WRITE FOR CATALOG 70/700-A

This 16-page catalog is yours for the asking. It tells the story of the 70/700 in pictures and text. Write for your copy today—no obligation.



242

BAY CITY

BAY CITY SHOVELS, INC. • BAY CITY, MICHIGAN

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

JUNE, 1955 • VOLUME 37 • NUMBER 6

HENRY T. PEREZ, Editor

CONSTRUCTION METHODS AND EQUIPMENT

Accidents Turn Back the Clock

ONE MAN WAS KILLED and dozens were injured last month when 10,000 sq ft of floor slab for New York City's new Coliseum collapsed during the pouring operations (photo). What caused the catastrophe is not known yet, if indeed it ever will be, even though it is under investigation by at least four separate groups.

Most construction accidents are easier to analyze, and mighty few can be attributed to an Act of God. Generally they can be traced to an act—or more probably an omission—of man. More often than not they are due to a bobble in the field, some shortcut taken without thought of the possibly dangerous consequences. Many are the result of taking a calculated risk (albeit without sound calculations) in a gamble to "get away with it." But when human lives are involved, there can be no gambling.

The public press gave the Coliseum collapse front-page prominence. And day after day the construction industry senselessly makes it possible for newspapers throughout the country to print headlines such as these: Scaffold Fails, Fall Fatal; Child Drowns in Abandoned Pit; Two Die as Trench Caves In; Crane Hits Wires, Operator Electrocuted; Boy Is Killed Playing on Tractor. There are hundreds of variations of these needless tragedies.

Wide World Photo

Why is it that scaffolding is not erected securely, that attractive nuisances such as water-filled excavations are not drained or fenced? Why can't trenches be shored properly? Why not de-energize dangerous wires, or fit crane booms with warning devices? And why must equipment be left unlocked or improperly parked for the night? Both the information and the material things necessary to make construction safe are readily available. It must be the will that is lacking.

Well, the will had better be there unless we want hampering restrictions placed on field operations. Just as the Coliseum collapse touched off a local public clamor for stricter codes and more rigid inspections, so do the less spectacular accidents.

We have been fighting for years for construction specifications that detail the results desired, not the method of achieving them. Yet we must achieve those results in a safe manner, otherwise some other body may be empowered to specify the method too. Defaulting on safety can only lead to trouble all around, for accidents turn back the clock of construction progress.

Willis Photo Art

Versatile powered buggies, three-lane finishing machines, and...

Ingenious Form Tricks Speed Deck Paving

By ALBERT C. SMITH, Associate Editor

JOINT VENTURE CONTRACTORS paving the six-lane deck of New York's Tappan Zee Bridge are using a whole bag of tricks to complete the 3.0-mi job this summer.

Besides a fleet of material-handling powered buggies, they have developed a new type bulkhead form of precast blocks and foam rubber, an expansion joint support made of half-round conduit, and a unique sidewalk form-stripping scaffold. Garafaro-West Shore-Euclid know that on a job this big, even the smallest trick can multiply itself into a substantial saving.

Working from both sides of the Hudson River, the contractors are placing a total of 33,000 yd of concrete in two 37-ft wide roadways, a 10-ft wide center mall, and two 3-ft sidewalks. The big operation now under way is the 1½-mi trestle section on the west side of the river. Main support members of the trestle deck are 50-ft long steel stringers spaced about 6 ft apart. Each bay has fifteen 27-in. stringers and two built-up facia beams.

Over this steel frame the contractor is building a 6¾-in. concrete deck. Bottom forms consist of ¾-in. plywood backed by 2x6 ribs 18 in. apart. Ribs are supported by double 2x6 walers hung from the stringers by ½-in. Richmond Tyhangers.

Because stringer spacing varies from 5 to 6½ ft, it would be uneconomical to cut plywood sheets to exact size. Instead, the contractor uses standard 4x8-ft panels and fills in the gap on each side with precut plywood closure boards. Minor variations are taken care of by placing 3-in. wide T-shaped magnesium strips in the remaining space.

This system has several advantages. First, maximum use of standard panels means that more than 75% of the plywood on the job never has to be cut. Second, the closure-strip method not only speeds stripping but also preserves the panels. Because of the

PLYWOOD DECK FORMS between stringers consist of standard 4x8 panels with closure boards on each side. Metal strips fill gaps.

WORKMEN WALK on 2x6 ribs laid temporarily between bottom flanges of stringers as they hang double walers from top flanges. Ribs are then moved up over walers and bolts tightened.

POWERED BUGGIES haul material from supply depots on bridge to forming crew. Here, Whiteman rig pulls trailer of reinforcing bars.

rush job, the contractor has only scheduled eight uses from forms, but they will still be in good condition to use on other jobs.

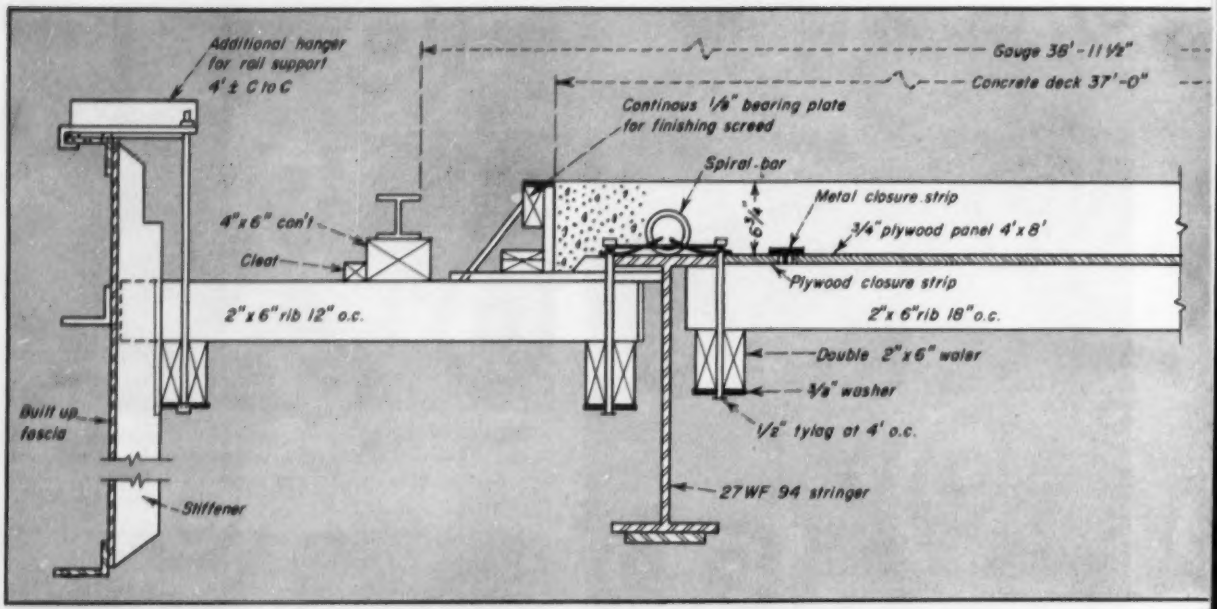
Another big forming problem is the longitudinal bulkhead form on the top of the stringer at the edge of the mall. Not only is it sandwiched between two lines of spiral bars welded to the stringer's top flange, but it also must accommodate transverse top and bottom reinforcing steel, a copper spline, and also serve as a guide for the finishing screed.

If the bulkhead were made of wood, it would be not only expensive to build but also nearly impossible to strip. So, Euclid's Charles Spero, project manager on the joint-venture, developed a unique solution—a bulkhead composed of precast concrete blocks, foam-rubber strips, and wood. Cast on the site in small forms, the 3⅝x1¾-in. blocks are rested directly on the flange of the stringer and extend about 10 in. between bottom bars. A copper waterstop spline is placed over the blocks and covered with a ⅝x2-in. removable wood-filler strip. Sponge rubber, 2 in. wide and ¾ in. thick, is laid on top of the wood filler to seal around projecting top reinforcing steel. It

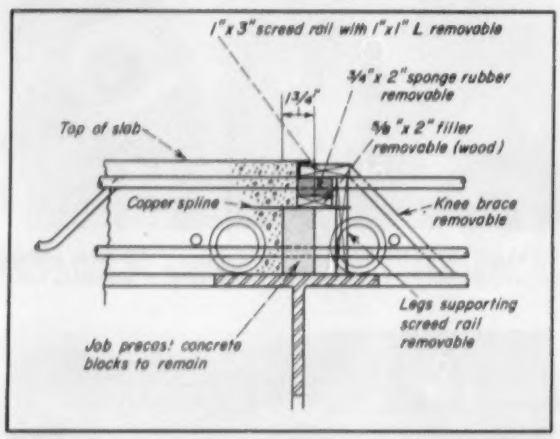
→

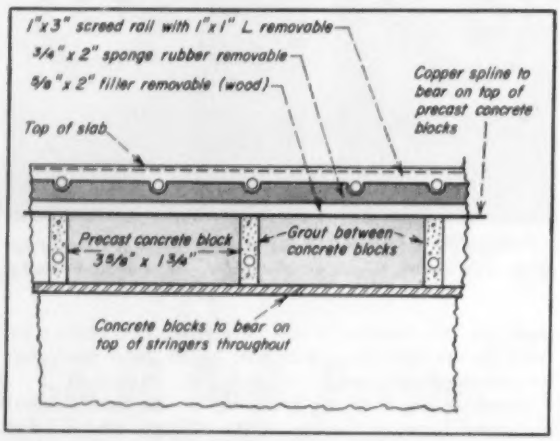
FLAT-BED BUGGY hauls double walers to front of forming operations. Contractor has fleet of 14 buggies on job.

TRAILER-PULLING BUGGY rides on runway erected over mall. Runway spearheads job to let buggies deliver materials anywhere.

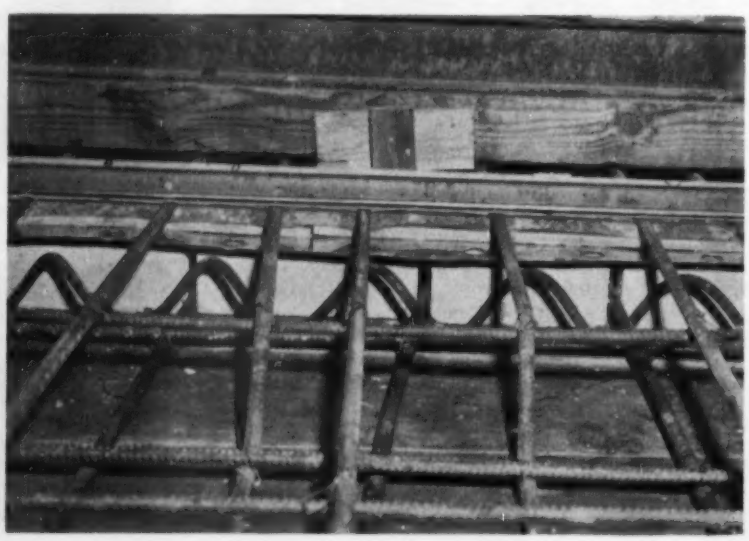


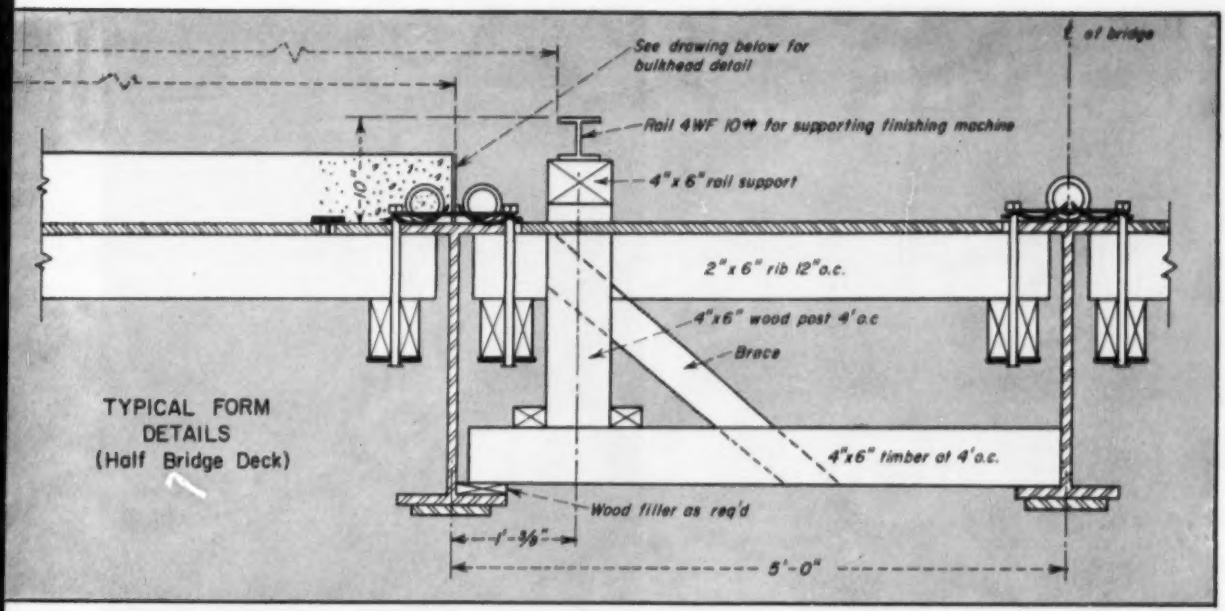
WOOD FORMS for 6¼-in. thick bridge deck consist of ¾-in. plywood sheets backed by 2x6 ribs spaced 18 in. apart. Ribs are supported by double 2x6 walers suspended from the stringers by Richmond Tyhangers. To avoid cutting standard 4x8 sheets to fit varying stringer spacing, the additional space is filled with precut closure boards. The gaps are taken care of with T-shaped mag-





PRECAST BLOCKS AND FOAM RUBBER solve tough bulkhead form problem. Not only is longitudinal form sandwiched between two lines of spiral bars welded to top flange of stringer, but it must also accommodate transverse top and bottom steel, a copper spline, and in addition serve as guide for finishing screed. A conventional wood bulkhead would be difficult to build, and nearly impossible to strip. So, the contractor developed a new trick—a bulkhead made of precast concrete blocks, foam rubber, and wood. The blocks are placed directly on the flange between bottom bars. A copper spline goes on top and is covered with a strip of foam rubber that seals around top bars. Braced wood strips are placed above the bars to guide the screed. The bulkhead is simple to erect, and fast to strip because the blocks stay in the slab.





nesium strips. Finishing machine rides on I-beam rails. The outside rail rests on 4x6's supported on 2x6 ribs 12 in. apart. On inside of deck, rail runs over 4x6's set on 4x6 posts spaced 4 ft on center. Posts, in turn, rest on 4x6's which span between bottom flanges of parallel stringers. Finishing screed rides top of longitudinal bulkheads. Sidewalks and center mall are poured separately.

eliminates drilling and patching of holes common on a conventional bulkhead.

Above the sponge rubber, a 1x3-in. wood strip is set in place and supported by removable wood posts and knee braces. A small steel angle over the inside edge of this wood strip serves as a screed rail. Most of the force from the screed is horizontal, and can be taken up in the knee brace.

Advantages of this type bulkhead are numerous. It is simple to erect because it involves only setting up precast blocks, a few strips of wood, and sponge rubber. Stripping is even easier. After the knee brace and screed strip are knocked out, the sponge rubber is easily pulled away from the rods and the filler strip follows. The precast blocks remain in the slab.

The bulkhead is proving to be one of the best time-savers on the job, and there are more than 25,000 lin ft required.

Expansion Joint

Another forming trick is at the transverse expansion joints. Plans call for a ¾-in. joint made of foam rubber, copper flashing, and a poured mastic. The joints are placed 50 ft apart between the ends of consecutive stringers.

Normal procedure would be to bulkhead the deck at the joint, pour alternate bays, strip, set up the intermediate forms, and pour the in-between slabs. But the contractor has another neat trick. To permit continuous pouring over consecutive bays, he places half-sections of concrete conduit back to back at each joint to support the copper and foam rubber assembly. Standard conduit is cast with a 5-in. inside diameter and a 7-in. square exterior, and with cast cut-outs to let the conduits fit under the flanges of the stringers. After curing they are split with chisels to make L-shapes. At an expansion joint, each split section is supported along one edge by a transverse channel and along the other edge by a post resting on the concrete bent below. Joint material is placed in between. A 16-gage steel cap covers the foam rubber during the pour, and is pulled out after screeding.

Properly erected, there is no problem of stability. It provides a solid, positive support for copper and foam rubber. This type of joint support is expensive, but will more than pay for itself over the entire job. It is fast and easy to place, and there is practically nothing to strip. Only the supporting posts are removed; the pipe sections stay in the slab.

Continuous pouring is also a big advantage. It simplifies equipment distribution, and prevents irregularities in finished slab grade across the joint, common in the alternate pour method.

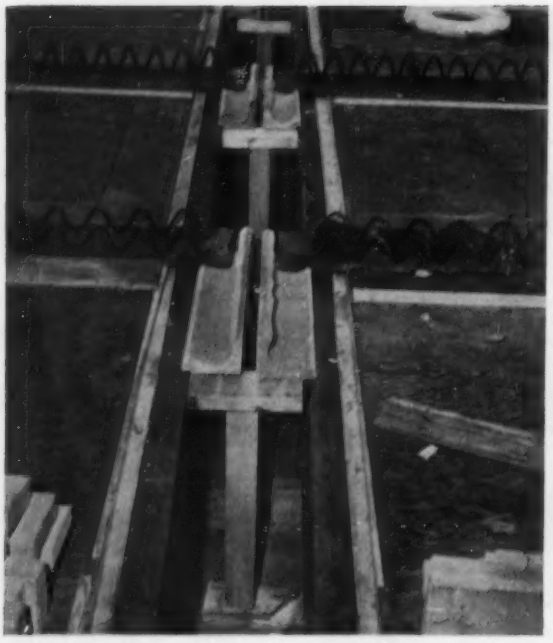
Material Handling

Form erection must be fast to keep pace with the tight construction schedule. And that means efficient materials handling.

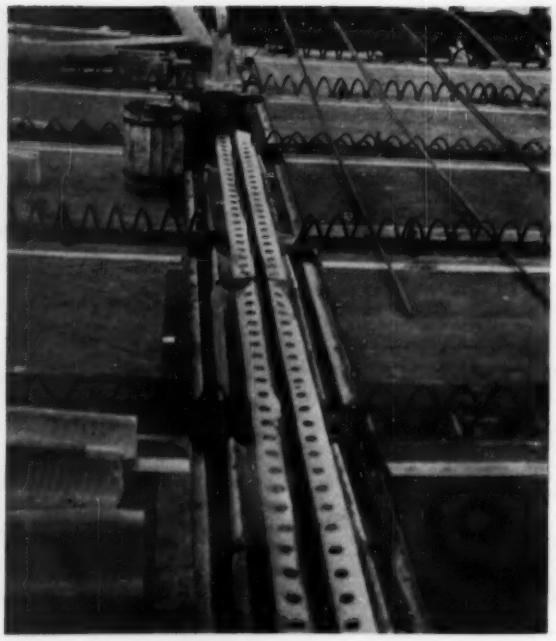
Lumber, steel, and concrete trucks can drive out on the bridge only as far as the last slab which has cured for 21 days. Beyond that point all materials are hauled by a fleet of Whiteman buggies, 14 conventional type with ½-yd buckets and two with flat beds. Ten of the bucket-type haul concrete to the finisher, and the other four carry supplies and pull trailers of material out to the form-setting crews. The two flat beds haul mostly lumber.

Beyond the last slab that has cured for 5 days, the buggies must haul over a runway built over the stringers at the center mall. This runway spearheads the job. The south half of the deck, which keeps about 1,000 ft ahead of the north half, is built entirely from materials fed from the spearheading runway. Plywood, walers, accessories, reinforcing steel, and closure strips are all carried out by the buggies and deposited within easy reach of workmen.

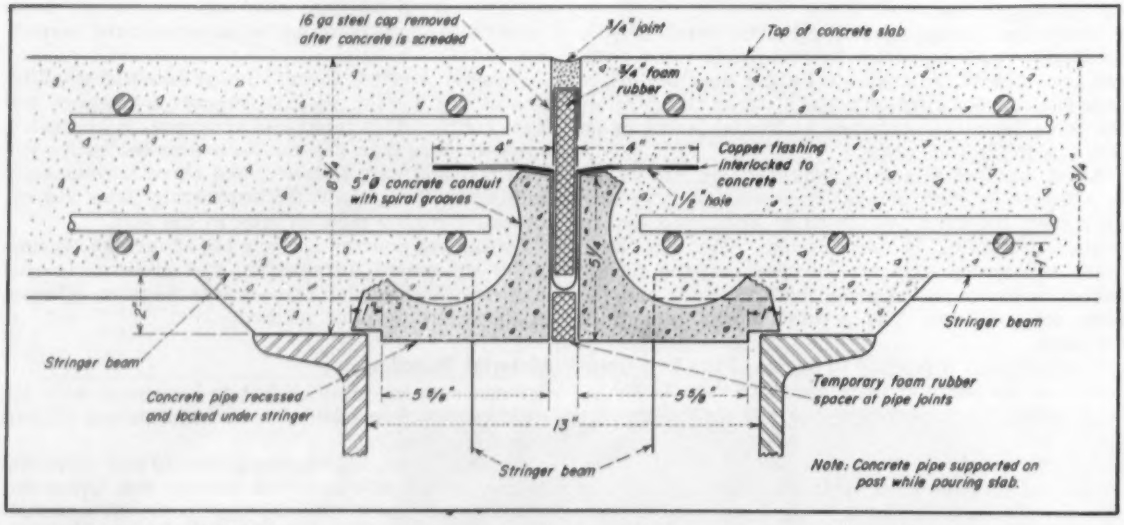
Because the south half of the deck keeps ahead of the north, concrete is also buggied out on the run-



EXPANSION JOINT SUPPORT consists of half-sections of concrete conduit held up by wood posts resting on spandrel beam of pier. Conduit sections are cut to fit under flanges of stringers.



FOAM RUBBER PLANK and copper waterstops are set in place between supports. Joint is easy to assemble, fast to strip, and eliminates pavement bumps by allowing continuous paving.



CONCRETE CONDUIT SECTIONS are placed back to back at each joint to support the copper and foam rubber assembly during the pour. Steel cap over foam rubber is pulled out after screeding and filled with mastic. Stripping is easy, for conduits stay in slabs.

way. During north-half pouring, the buggies ride on the south slab to the point of placement, and then jump the center mall on a movable wood ramp. When the ready-mix trucks can empty close to the pour, only 4 to 6 buggies are needed. On 1,500-ft hauls, up to 10 are called upon.

Ready-mix trucks load at a batch plant near the abutment, drive out on the bridge, turn around, and back up on a ramp to get high discharge. After the proper mixing time, the concrete is dumped into a two-gate CMC hopper. Buggy operators quickly move under the hopper, load their own machines without getting off, and then speed up to 15 mph to the pour.

The contractor finds it pays to keep a wide 18-ft dumping platform ahead of the finisher to keep buggies from getting bottlenecked. The platform is made in three sections to keep one section always leapfrogging ahead. Movable bridges sometimes used on this type job were considered, but it was figured that the high initial cost, plus the loss in flexibility, would not make it pay.

As the concrete is dumped and vibrated across the 37-ft slab, it is screeded with a Heltzel Flex-Plane

READY-MIX CONCRETE TRUCK backs up timber ramp on bridge deck to discharge mix into double-gate hopper. Whiteman motorized buggies are driven under gates, and operators quickly load buckets without leaving seats. Size of buggy fleet depends on haul. Maximum hauls are about 1,500 ft and requires 10 buggies. Normally, hauls less than 1,000 ft are handled by 6 units.

QUICK-DUMPING BUCKET empties ½ yd of concrete in front of advancing finishing spread. Vibrator consolidates mix into form.

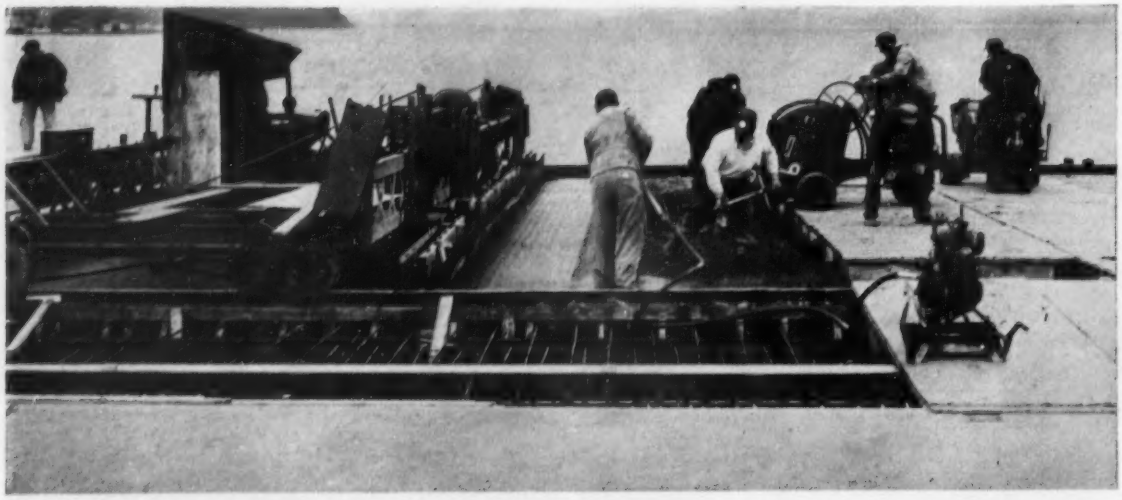
WOOD MALL RAMP and dumping platform on deck form are leapfrogged ahead. The 6x7 ft platforms are set on 2x6-ft bolsters.

finisher riding on H-beam rails. The outside rails rest on a 4x6 supported on 2x6 ribs 12 in. on center hung from the outside stringers and the facia beams. On the inside of the deck, the rail runs over a 4x6 timber set on 4x6 posts 4 ft on center. The posts, in turn, rest on 4x6 timbers which span between the bottom flanges of parallel stringers.

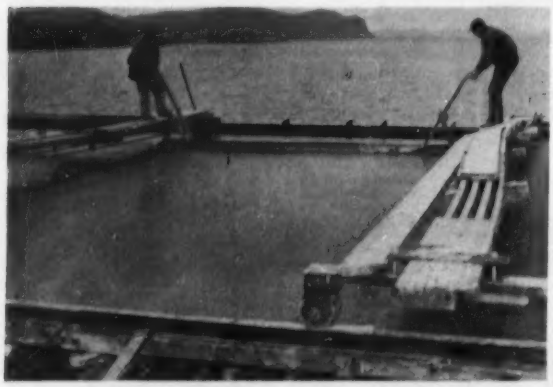
After the screed makes two passes, the concrete is hand-finished. A two-man bull float removes most of the irregularities and then 10-ft steel hand lutes are used. The metal caps at the expansion joints are next pulled out and the surface is given a burlap-drag finish. Burlap strips are then placed on top and the concrete is water-cured for 7 days with perforated hoses. Production averages six 50-ft bays, or 250 yd in about 6 hr.

Stripping

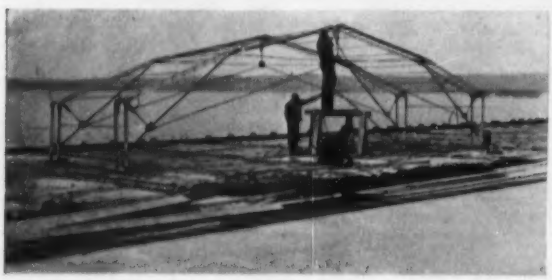
Stripping is permitted 8 to 10 days after a pour. On the 1½-mi trestle section, stripping crews work from three 25x50-ft scaffolds built on 5x5x7-ft pontoons. Normally, the platform rides about 7 ft under the forms, with a 3-ft variation for tide. Stripping is simple. When the bolts are removed, the walers



FINISHING MACHINE makes second pass over 37-ft wide roadway slab, as buggies dump concrete from movable wood platform. Heltzel finisher rides on steel rails. Inside rail is supported on 4x6 posts and outside rail on 2x6 ribs 12 in. apart.



HAND BULL FLOATING follows behind finishing machine. Workmen walk on job-made bridges made of wood planks and wire rope.



FRAME FOR RAIN COVER is made of aluminum ladders. It is covered by polyethylene film to shield concrete during finishing.

SIDEWALK FORM-STRIPPING SCAFFOLD is hung from counterweighted truck. Frame pivots to horizontal for moving across bridge.

come loose, the ribs, and finally the plywood. (Lumber is free of concrete washings because the contractor keeps a man in a boat underneath cleaning during the pour with a 1-in. Homelite pressure pump.)

Sidewalks, which are poured directly by ready-mix trucks, are stripped from below by two workmen supported by a special scaffold. A counter-balance truck cantilevers a steel frame and cage over the side of the bridge. The scaffold is pivoted to a horizontal position for moving to opposite bridge side.

Design and construction supervision for the New York State Thruway Authority is handled by Madigan-Hyland, New York. H. Knox is project engineer and G. Mullen is resident engineer on the deck.

Garafano Construction Co. (Mt. Vernon), West Shore Concrete Co. (Suffern) and Euclid Contracting Corp. (New York City) jointly are general contractors for the deck work. Charles W. Spero is project manager and superintendent, assisted by J. Novellino, F. Yuzzolo and J. Czerkawski.

Heavy Construction Grows Giants

HEAVY CONSTRUCTION is a risky and competitive business where "the men are soon separated from the boys." Some of these men grow to be giants. That's the story of Morrison-Knudsen.

Like most construction outfits, M-K started out at the bottom. Total construction revenues in its first year, 1912, were a modest $75,000. They grew more or less steadily between that year and the late thirties. Then the World War II defense construction boom came along and M-K began to move up fast. Gross revenues in 1940 climbed to $11.7 million, and the chart shows the rapid growth in engineering and contracting revenues since that time.

Where Morrison-Knudsen Revenue Dollar Goes

Per cent of total revenues in '54 going to . . .

EXPENSES:	
Construction and other operating wages	29.2
Construction materials, supplies, equipment depreciation & other operating expenses	56.9
Cost of merchandise sold	4.1
Administrative expense	4.4
Interest paid on borrowed money	0.4
Federal taxes on income	1.4
Dividends	1.7
Retained earnings	1.9

Source: 1954 Annual Report of Morrison-Knudsen Company, Inc.

The original partnership of Morrison-Knudsen is now a large corporation with domestic and overseas subsidiaries. Gross revenues of the parent company and its domestic subsidiaries topped $156 million during 1954, according to the M-K annual report. This doesn't include the revenues from more than $83 million in construction completed by its overseas subsidiaries in 1954.

Principal domestic subsidiary of Morrison-Knudsen is the H. K. Ferguson Company which specializes in designing and constructing industrial plants. H. K. Ferguson handled $43 million of the total $53 million in construction completed by M-K's domestic subsidiaries during 1954.

Besides adding to its subsidiaries, M-K has also increased its business by taking part in numerous joint ventures. Last year, the parent company was on the job in 45 joint ventures, which accounted for more than one-third of the 129 contracts handled by the parent company during the year.

Global Market

In 1954, M-K and its subsidiaries were on the job in five continents. The parent company itself worked on 129 separate contracts in 19 states and U. S. territories and in one foreign country. Meanwhile, its overseas subsidiaries were working in 15 countries representing every other continent except Africa.

Among the major overseas projects started during '54 were "the Chotano-Chancay Tunnel . . . for diverting tributary waters of the Amazon River through the continental divide to serve the Chancay Irrigation System" in Peru; "the 360-mi, 16-in. Sui Gas Pipe Line between Sui and Karachi, Pakistan . . .; and irrigation systems and hydroelectric power plants in Afghanistan."

Competition is getting tougher overseas just as in this country, according to the M-K report. American contractors are at a "pronounced disadvantage" in some countries because of unstable exchange rates and the difficulties of converting revenues to U. S. dollars. The report notes that while some European countries have set up machinery to facilitate converting currencies which help their contractors, the U. S. has arranged

(Continued on page 114)

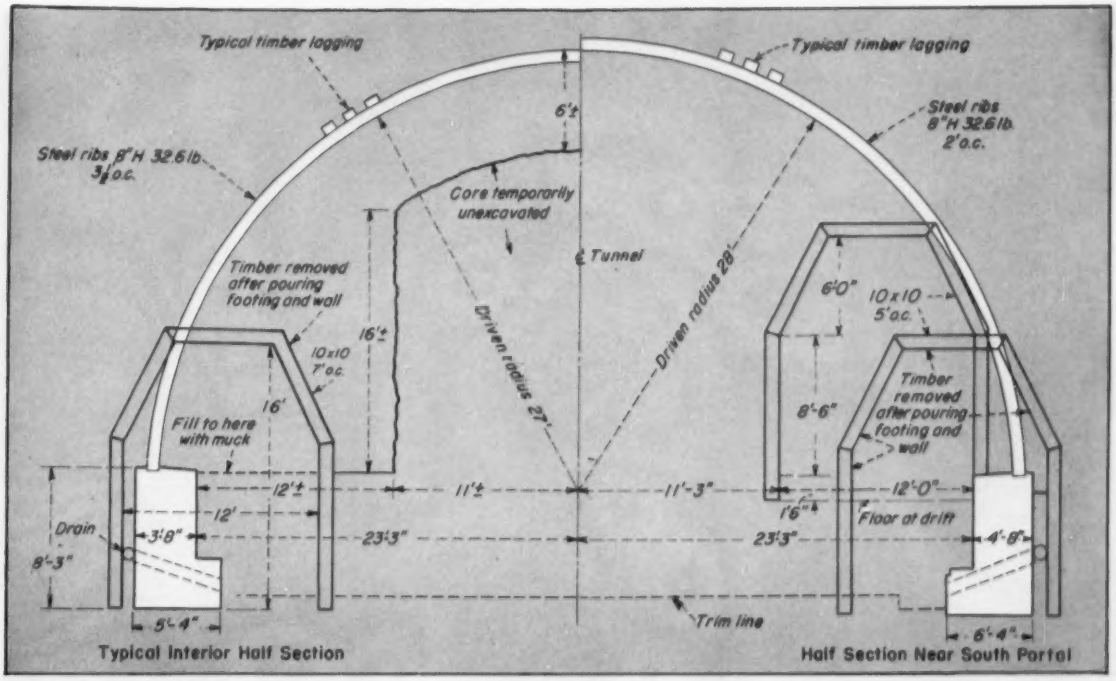
By side-drift access to interior ring cut that was advanced to both ends ...

They Drove This Tunnel Inside Out

FIRST DRIVE AND HOLE-THROUGH two side drifts and pour the lower tunnel wall. Next drive two additional but higher side drifts 150 ft to pass bad ground near the portal. Stope up from the ends of these latter drifts to make a ring cut and set rib steel.

LOWER SIDE DRIFTS mark start of Waldo Tunnel. Each 12x16-ft drift is heavily timbered with 10x10's as it is advanced northward from this south portal. A 12,000-cfm blower ventilates each.

FAST MUCKING is done by Eimco 105 loader that dumps into Koehring Dumptor fitted with exhaust scrubber for underground work. Hill has been cut back to the location of the tunnel portal face.

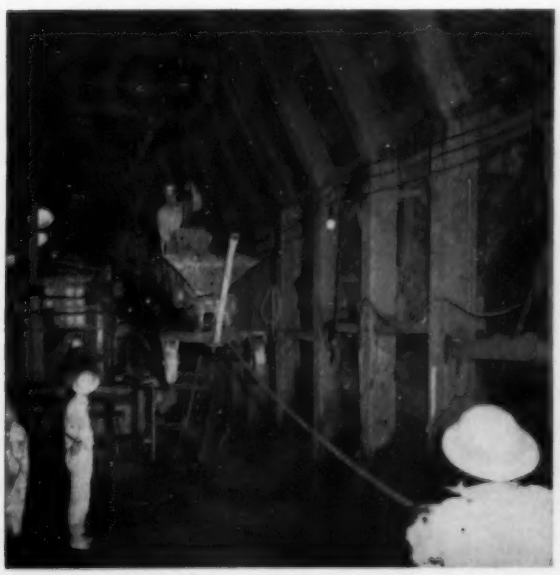


TUNNEL SECTIONS show method of attack. First, lower side drifts were holed through, and pouring of wall footings started. Upper side drifts from south portal were driven only 150 ft to pass bad ground. From this point, stopes were made up each side to round out the arch so rib steel could be set. Arch cut was continued to north portal, then direction was reversed to south.

Advance the ring cut and steel sets to the far portal, leaving a central core lengthwise in the bore. Reverse directions and, in the same manner, advance carefully through the bad ground to the original portal. Finally, remove the central core and line the bore.

That's the way Guy F. Atkinson Co. drove the Waldo Tunnel for a new north approach to San Francisco's Golden Gate Bridge. The side-drift method not only overcame safely the nasty ground encountered, but also had the added advantage of allowing the central core to be used as a working platform for drilling and blasting the ring.

The 1,000-ft tunnel, roughly a semicircle with a 56-ft driven diameter, was pushed through a hard, faulted shale. Starting from the south portal, Atkinson first



WALL FOOTING FORM is readied for concrete within the lower side drift. Concrete conveyor is moved by chain hoists from monorail, and same method is used for moving 30-ft steel panel forms.

FOOTING CONCRETE is delivered by transit-mix truck that backed in from north portal. Conveyor transfers mix to the forms. On two-shift operation, one 30-ft pour is made each day each side.

RING CUT IS MUCKED by Eimco loader. Projecting up at lower left are reinforcing rods from wall footing that was poured in side drift. Lower side drift appears at left, stretching ahead of ring cut, while at right is the unexcavated core to be dug later.

CROWN IS DRILLED from top of unexcavated core by Ingersoll-Rand lightweight drills on air legs. Side drifts were drilled by jumbo-mounted I-R drifters on Gardner-Denver booms.

drove 12x16-ft drifts at the lower corners of the tunnel. Each advance was 5 to 8 ft.

A single crew worked both drifts alternately, i.e., while one was being drilled and shot, the other was being mucked. For the drilling, a jumbo carrying five Ingersoll-Rand drifters on Gardner-Denver booms, and mounted on the rear of a Peterbilt truck chassis, was run in the bore. Mucking was handled by an Eimco 105 loader casting into Dumptors. To hold the ground, five-piece timber sets, 10x10-in., were placed from the drill jumbo. Two 12,000-cfm American and Sutorbuilt blowers, one for each drift, provided ample ventilation.

After the side drifts were holed through, heavy concrete wall footings 8¼ ft high were poured in them, working from south to north. A transit-mix truck would back in from the north portal and discharge concrete into an elevating conveyor to fill the 30-ft long steel-

HOLES ARE LOADED with Hercules dynamite for blast that will pull about 3½ ft so next set of 8-in. 32.6-lb H-beam ribs can be placed. Platform jumbo on rear of Peterbilt truck helps with the drilling and hole loading, and also setting the steel ribs.

panel form. Conveyor and forms were handled by a monorail suspended from the timber sets.

When footing pours had progressed part way through the tunnel, two additional side drifts were started to pass bad ground at the south portal. These overlapped the original drifts somewhat, and were driven in a manner similar to them. However, not all the muck was removed—some of it went into the lower drifts to make level floors up to the top of the footings.

When the upper side drifts had been advanced into good ground, about 150 ft from the portal, breakups were made to round out the arch. The stope was 6 ft high at the crown and just wide enough for placing the first two sets of permanent timbering (8-in. 32.6-lb H-beams on 3½-ft centers).

With these ribs in place, the ring cut was advanced, one rib at a time, to the north portal. The cut was 6 ft high at the crown,

RING CUT IS HOLED THROUGH to north tunnel portal. Now direction of attack will be reversed to make ring cut through previously by-passed 150 ft of bad ground at south portal.

PORTAL FACING IS POURED at south end of 1,000-ft tunnel whose driven diameter is 56 ft. Two truck cranes handle buckets that transfer concrete from trucks to forms.

FINAL EXCAVATION IS MADE by Caterpillar DW20 scrapers that muck out from top of wall footing down to subgrade. Grader goes inside to move material away from sides.

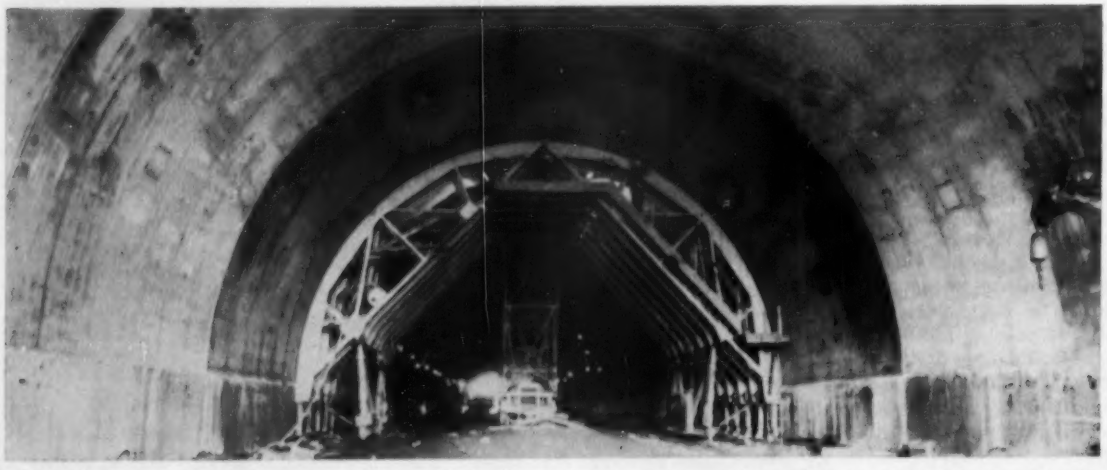
but widened to about 17 ft on each side at the level of the top of the wall footings. This left a central core of unexcavated material roughly 20x22 ft in section. Some of the blast holes for the ring cut were drilled by Ingersoll-Rand air-leg drills from on top of the central core. Others were drilled from a platform jumbo on a truck, or from staging placed between core and ribs.

Behind ring excavation and rib setting, and as time permitted, the central core was knocked down. Spoil from this and from the ring was mucked by Eimco loader and taken by Dumptors out through the upper side drifts.

When all the ribs had been set to the north, operations were reversed to work southward from the location of the original stopes. When this ring cut was holed through, the rest of the central core above top-of-footing level was excavated. The remainder down to subgrade was drilled and shot and removed by Cat DW20 scrapers.

Concrete tunnel lining varied from 3 ft at the springing line to 2 ft at the crown, except near portals where it was 1 ft thicker throughout. It was poured in Blaw-Knox collapsible steel forms 30 and and 20 ft long, that were fed transit-mix concrete by two double Pumpcrete machines.

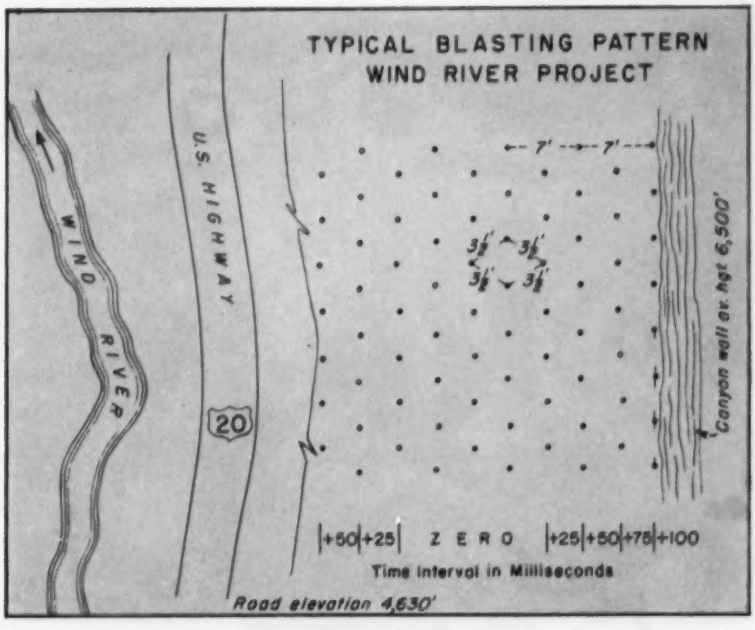
Guy F. Atkinson Co., San Francisco, drove the Waldo Tunnel for the California Division of Highways. R. W. Atkinson was project manager; George T. McCoy, Jr., project superintendent; A. G. Chaussee, assistant superintendent; Mike Roych, tunnel superintendent; and Edwin W. Schlue, project engineer.



TUNNEL IS LINED with concrete poured in rail-mounted Blaw-Knox collapsible steel form 30 ft long. On tunnel centerline just behind form is truck-mounted scaffold jumbo that carries Pumpcrete lines to crown. Concrete is supplied by two Pumpcretes.

Bid on this job was $60,000 lower because . . .

Contractor Uses Lightweight Equipment



DRILLING ON THE WYOMING WIND RIVER project is on a 3½x7-ft elongated or rectangular pattern. Occasionally it's varied to 3x6 ft. Hole depth averages 15 ft 9 in.

THE METHOD OF DRILLING ROCK with lightweight jackhammers and carbide tipped drill steel is becoming increasingly more popular.

An example of how such lightweight equipment can pay off is on the Wind River Canyon project—a highway knifing through central Wyoming between Shoshoni and Thermopolis. Low bidder on 3 mi of grading and surfacing in the 11-mi canyon was Inland Construction Co. of Omaha, Neb. with a bid of $529,875—$60,000 lower than the nearest bidder.

"I've never hit a tougher rock in my 28 yr in these mountains," says Inland's Superintendent Dan Ratliff. "How did we happen to bid so much lower? I was sure we could break and shoot this tough rock with those Swede drills. I had used them before, and I knew what you could do with them. The results on this project speak for themselves."

The Swede drills Ratliff refers to are Atlas-Copco model RH656-

INLAND'S SUPERINTENDENT Dan Ratliff, right, together with Darrell Robertson, project engineer, watch powder loading.

SPECIFICATIONS LIST the Atlas-Copco model RH656-4W jackhammers as weighing 46 lb, less weights. The drillers keep graduated lengths of steel near by for their holes. Changeovers were timed as low as 12 sec. Two 915-cfm capacity compressors supplied air.

4W jackhammers fitted with ⅞-in. Sandvik Coromant hexagonal drill steel, which is tipped with an integral tungsten carbide insert. They are distributed by Copco Companies. The drills are extremely lightweight, involving less fatigue to the chisel-type bit. Operated by one man, they are quick and easy to handle. The carbide-tipped steel enables the driller to begin with a small diameter starter, yet finish with the required diameter hole. All these features are said to result in higher output, a savings in wages, initial costs, compressed-air consumption and rock-drill upkeep.

The Wind River project itself goes through unusual rock formations of diorite, red granite, Flathead sandstone, and limestone. Maximum cuts 1,100 ft long, 95 ft deep and 60 ft wide are being made at elevations up to 4,630 ft in solid rock. Bids on 195,200 yd of Class A excavation (solid rock) were made at $2.00 and $1.68, but Inland got it with a low bid of $1.33. Class B, 145,000 yd, went at 91c.

Drilling is on a 3½x7-ft elongated or rectangular pattern, oc-

(Continued on page 74)

JACKHAMMER OPERATION was kept at peak efficiency in weather as cold as 25 deg minus by Tanner Liquid gas injected into the air lines to keep the cylinders from freezing.

CATERPILLAR ANNOUNCES

A NEW LINE OF PORTABLE ELECTRIC SETS

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USE CAT PORTABLE ELECTRIC SETS

- When you're on a remote location with no high line power available.
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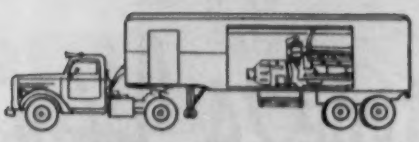
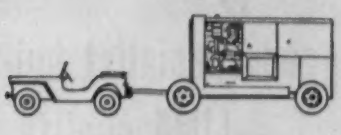


CAT* Portable Electric Sets are now available in 9 models, 30 to 315 KW



These Caterpillar Portable Electric Sets are ready to serve you in emergency or full-time operation. They are available in all the usual voltages, 50 or 60 cycle.

Each is a complete unit, with cooling system, fuel tank and switch-gear, mounted on skids, semi-trailer or full trailer, ready to be moved anywhere you need it at a moment's notice. Even the biggest trailer-mounted set is well within highway weight and size restrictions.

The units are easy to hook up, easy to operate. They deliver steady voltage and require a minimum of supervision. Low fuel and maintenance costs are added advantages.

In this new line of portable electric sets, there's one that will exactly fit your needs. Get complete information from your Caterpillar Dealer. Call him today.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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The brand new LIMA type 24 *Jobmaster*

...a rugged specialist built with LIMA quality to fill your on-the-job requirements

Your on-the-job requirements are the key to design and construction of the brand new ½ yd. Lima Type 24. It's *your* machine, a rugged specialist built with traditional Lima emphasis on quality . . . to give you top performance without costly maintenance.

To fit it for every job within its class, the Type 24 is available with gasoline, diesel or electric power and can be equipped for operation as a shovel, crane, clamshell, dragline or pullshovel . . . crawler, wagon or truck mounted. With its air controls, all-welded construction and built-in stamina, the Lima 24 is from every angle the star performer in its class. Just check the list of Lima quality extras (at right); each one means greater operating benefits for *you.*

Put the new Type 24 to work for you now. It can build your operating profits everywhere you use it. Get complete details today from your nearby Lima distributor, or write to Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

COMPARE QUALITY! No other machine gives you as much as Lima!

These quality extras are yours with the Type 24:

Rugged Construction for Low Maintenance

All-welded steel construction.
Splined shafting.
All gears have machine cut teeth.
47 anti-friction bearings.
Heat treated ground shafting.
Inside dipper handle—square cross section.
Safety glass throughout.
Dirt seals in tread rollers.

Top Performance

High speed independent boom hoist with engine controlled boom lowering.
Large diameter hoist, crowd, swing and propel brakes.
Large diameter hoist, crowd, swing and propel clutches.
Internal-external tooth jaw clutch for quick engagement, minimum backlash in gear train.
Independent combination chain and cable crowd and retract.
Independent propel (optional).
Independent third drum (optional).

Ease of Operation

Air for main and auxiliary controls.
Differential steering (similar to tractor).
Easily convertible to pullshovel, dragline, crane or shovel.

BRIEF SPECS—LIMA TYPE 24	SHOVEL	CRANE	DRAGLINE	PULL SHOVEL
Length of boom (standard)	16'6"	30'0"	30'0"	17'6"
Length of dipper handle	13'3"	———	———	6'0"
Overall length of crawlers				
—standard truck	10'2⅛" max.	10'2⅛" max.	10'2⅛" max.	10'2⅛" max.
—long & wide truck	11'9¼" max.	11'9¼" max.	11'9¼" max.	11'9¼" max.
Overall width of crawlers—				
Standard truck with 16" treads	8'0"	8'0"	8'0"	8'0"
Long & wide truck with 16" treads	9'4"	9'4"	9'4"	9'4"
24" and 30" treads optional on standard and long and wide truck				
Height of gantry above ground	9'8⅛"	9'8⅛"	9'8⅛"	9'8⅛"
Rear end clearance—maximum counterweight	8'11¼"	8'11¼"	8'11¼"	8'11¼"
Overall width of cab	7'10¾"	7'10¾"	7'10¾"	7'10¾"
Swing speed (R.P.M.)	4.2	4.2	4.2	4.2
Travel speed (high)	1.9	1.9	1.9	1.9
Capacity of fuel tank (gallons)	39	39	39	39
Approximate working weight	27,000	31,250 (with max. cwt.)	30,325 (with max. cwt.)	32,375

The Type 24 is a glutton for work . . . and Lima quality-construction enables it to travel and work anywhere at lowest operating cost.

Truck mounted for fast over-the-road travel, the Type 24 gives you maximum job mobility for extra production.

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CAPACITIES

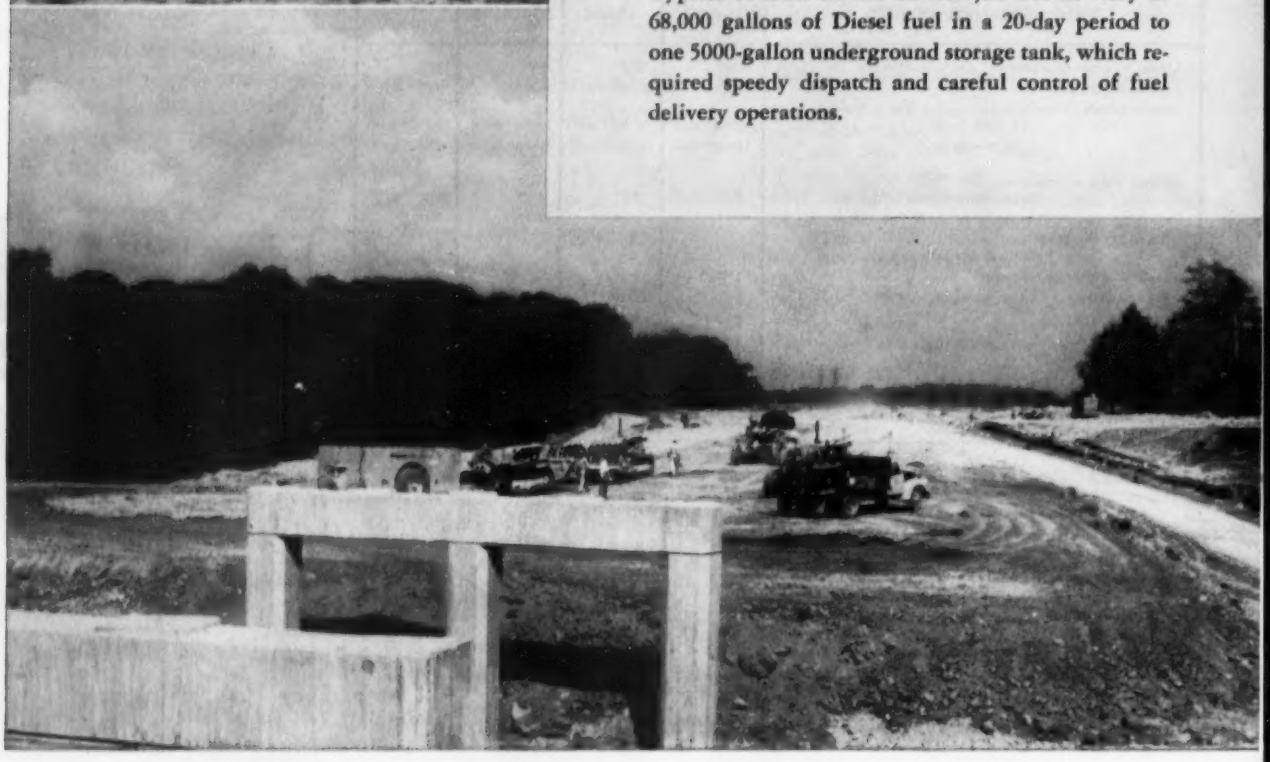
LIMA Shovels, Cranes and Draglines are made in the following capacities:

SHOVELS	CRANES
to 6 yards	to 110 tons
DRAGLINES	PULLSHOVELS

Smaller machines available on rubber.

GULF PRODUCTS

Peter Kiewit Sons' Company and Condon-Cunningham Company have the contract for Sections C-20 and C-21 of the Ohio Turnpike, which comprises 6.2 miles between Strongsville and Olmsted Falls, Ohio. Work involves moving over 1,000,000 cubic yards of dirt, with extremely poor soil conditions. Typical of Gulf service on this job was delivery of 68,000 gallons of Diesel fuel in a 20-day period to one 5000-gallon underground storage tank, which required speedy dispatch and careful control of fuel delivery operations.



and FINE SERVICE

keep equipment rolling

on the Ohio Turnpike Project

The Ohio Turnpike is another huge and important project where a large percentage of the participating contractors rely on Gulf to keep their equipment operating efficiently.

Contractors like Peter Kiewit Sons' Company and Condon-Cunningham Company, for example, appreciate the clean-burning, high-performance properties of Gulf gasoline and Diesel fuels—as well as Gulf's prompt delivery service.

Let us discuss with you how Gulf quality products and fine service can help on your next job. They are quickly available to you through more than 1400 conveniently located warehouses.

GULF OIL CORPORATION • GULF REFINING COMPANY
1822 Gulf Building Pittsburgh 30, Pennsylvania

GULF

THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS

LIGHTWEIGHT EQUIPMENT . . . Continued from page 68

DRILLERS DRESSED in winter clothes and kept busy to keep warm on this job. Even in frequent snowstorms work continued.

A 9-LB PORTABLE air-operated grinder also made by Atlas-Copco was moved from jackhammer to jackhammer to sharpen drill steel.

casionally varied to a 3x6-ft pattern. Hole depths range up to 21 ft with an average of 15 ft, 9 in. Starter steel is a 1⅝-in. gage and the 21-ft length is 1 5/16.

Experience on this project has shown 1.15 ft of drilling per cu yd excavated in the hard-breaking rock. Interesting too, is the economical powder cost made possible by the small bit dia of the integral tungsten carbide-tipped Swedish steel.

An average of 600 holes per shot are loaded with DuPont 40% Gelex and Special Gel in 1x8-in. sticks. Detonation sequence is by rows from the center at intervals of 25 milliseconds.

Drill steel is sharpened on the job with a portable Atlas-Copco RS-710 grinder, a 9-lb air-operated machine that is carried to the steel. The sharpener moves from jackhammer to jackhammer eliminating delays in drilling, and abolishing overtime night work to keep the steel sharpened.

Working conditions on the project from December to March were anything but ideal. Snowstorms, and temperatures ranging down to minus 25 deg, made it tough. In spite of this, Inland has lost only 10 working days, although they originally estimated a downtime loss of as much as 6 weeks. One reason production was able to continue was Tanner Liquid gas injected into the air lines to keep the drill cylinders from freezing. This maintained peak jackhammer operation. Zerex anti-freeze protected the engines of Inland's other equipment.

JOB SUPERINTENDENT RATLIFF, center foreground, points out drilling pattern to Foreman Roy E. Nash, left. Rock formation was diorite, red granite and Flathead sandstone.

Initial Cost Lower

The use of jackhammers compared to wagon drills has resulted in a substantially lower initial cost (50%) in rock-drilling equipment. This figure is based on the computation that 915-cfm capacity of two compressors on the job would operate three wagon drills or 15 jackhammers, obtaining five times more footage drilled (equal drilling speed per machine) for 2½ times greater operating labor costs (15 jackhammer operators versus six wagon drill crewmen).

Equipment used on this project is listed on following page.

AFTER THE ROCK WAS SHOT, Northwest 2½-cu yd shovel loaded the material into Athey PR-21 Rock Wagons of 22½-cu yd capacity. The rock wagons were pulled by Caterpillar DW-21 tractors. Cuts 95 ft deep and 60 ft wide were made in solid rock.

What It Takes To Move 195,200 Yd of Rock

- 1 2½-yd Northwest shovel
- 1 ¾-yd Koehring shovel
- 3 DW-21 Caterpillar tractors with Athey PR-21 rock wagons
- 3 D-8 Caterpillar bulldozers
- 1 Hough loader
- 1 #12 Caterpillar grader
- 1 Austin-Western grader
- 1 Chicago Pneumatic compressor, 600 cfm
- 1 Chicago Pneumatic compressor, 315 cfm
- 2 Jaeger compressors, 125 cfm
- 16 Atlas-Copco RH656-4W jackhammers with weights
- 1 Atlas-Copco RH571-3W jackhammer
- 1 Atlas-Copco RS-710 steel grinder

JACKHAMMERS compared to wagon drills resulted in a 50% lower initial cost in rock-drilling equipment, according to Inland Construction Co. of Omaha, Neb. Powder cost was lowered by small bit dia of integral carbide-tipped steel.

How Much Do You Know?

Here's a low-pressure quiz concerned with your own industry. Circle each one you think is right and then turn to page 197 and see how close you came to the correct answer.

1. In 1954 new construction amounted to: 1 billion dollars; 4 billion; 37 billion; 19 billion.
2. Maintenance and repair expenditures in 1954 totalled 18½ billion dollars; 15 billion; 22 billion; 9 billion.
3. The construction industry, directly and indirectly, was responsible for the employment of: 1,876,000; 2,232,000; 4,000,000; 9,400,000.
4. New construction in 1955 will amount to 47 billion dollars; 6½ billion; 94 billion; 39½ billion.

G-J-S—Masonry Building—May; Engineering News-Record—June 2; Construction Methods—June; New England Constr.—July 15; Constructioneer—July

When figuring earthmoving costs...

THE No. 12 GOES ON THE CREDIT SIDE

The Caterpillar No. 12 Motor Grader is a big, versatile machine that always is entered on the credit side of ledger books. Particularly when you figure earthmoving costs.

Knutson-Gould Construction Co. of Kansas City, Mo., knew that when it began hauling fill for the approach to the Missouri Bridge at Jefferson City. Here, you see its CAT* No. 12 Motor Grader as the cost-cutting member of a team of equipment moving 260,000 yards of loess and clay.

The No. 12 is maintaining the haul road. By so doing, it is wringing the last cent of economy out of the big tractor-scraper teams. They can haul their maximum capacity at the highest possible speed. The D7 and D8 pusher Tractors are not called away from the borrow pit to help rescue mired-down equipment.

And down time costs are slashed because the road is an *aid* to the tractor-scrapers, not a torture trail that causes breakdowns.

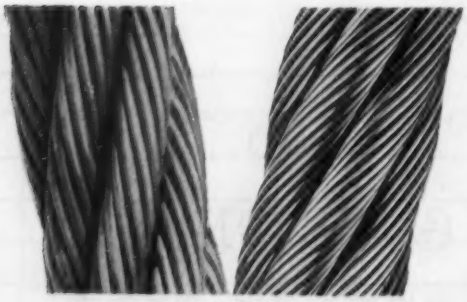
Your Caterpillar Dealer will be glad to show you the No. 12, No. 112 and the No. 212 Motor Graders at work on your job. Have him demonstrate the reasons successful contractors always put Cat Motor Graders on the credit side when they figure earthmoving costs.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

99% OF ALL CAT MOTOR GRADERS EVER BUILT ARE STILL IN USE



ROEBLING ANNOUNCES ITS NEW

Royal 1105 Blue

WIRE ROPE . . . 15% STRONGER THAN YESTERDAY'S GUARANTEED STRONGEST!

15% MORE STRENGTH is a whopping improvement. But translate that extra strength into terms of increased service life and you've really got something to brag about.

★ What's more, Roebling is pulling no punches on the variety of this new rope that will soon be available. You'll be able to get **ROYAL BLUE** Wire Rope in EVERY DIAMETER from ¼" to 3½"... in EVERY STANDARD CONSTRUCTION with an independent wire rope core.

★ In addition to new high strength, Roebling type 1105 wire – the finest high carbon rope wire ever produced – gives **ROYAL BLUE** Wire Rope amazing toughness and resistance to impact, crushing, abrasion and fatigue.

★ As the first step toward completely new service economy, write us for the whole story on **ROYAL BLUE** Wire Rope, or contact your distributor or nearest Roebling branch office.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1950 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

PAVING ON THE HOMESTEAD AIR BASE is laid with the new Blaw-Knox bituminous paver-finisher. Rig is equipped with pneumatic tires, floating screed and tamper, and puts material down in 13-ft strips. Paving speed averages 38 fpm.

Tar-Rubber Paving Gets Hi-Speed Treatment at Florida Air Base

MIXING PLANT located 1½ mi from field, is a 6,000-lb batch-type Simplicity S-100. It has belt feeder, three dryers, dust collectors with sprinklers. It's controlled manually.

THREE MILES as the airplane flies, northeast of Homestead, Fla., an abandoned World War II Air Force base has sprung to life. Right at the moment it's not ready for the jets that will be using it, but $21,000,000 is being spent to make this 1,200-acre spot one of the most efficient bases in the South. Contracts numbering 18 in all have been awarded, and work is already underway on new buildings, runways, aprons and utilities. According to Resident Engineeer, Lt. Col. John S. Hassell, Corps of Engineers, U. S. Army, no date has been set for the final completion of the project, as more contracts will probably be awarded.

Construction procedures and techniques being utilized at this base are all interesting, but the one being watched with most interest is the tar-synthetic rubber paving being applied to part of the runway and on an 1,150x8,000-ft apron.

Major share of the paving contract, amounting to $3,100,000, went to a joint venture of W. T. Price Dredging Corp., Miami, and Blythe Brothers Co., Charlotte, N. C.

More than 2,000,000 yd of unclassified material is being moved, primarily limerock. The contractor is using tractors equipped with rippers and plows to scarify the material. The subgrade ratio of cut to fill is about 1/3 to 2/3 respectively.

After the material is loosened, a fleet of 18 scrapers loads, hauls and spreads it. Two Hyster grid rollers

FLORIDA AIR BASE . . . Continued

MATERIAL MOVED is limerock—2,000,000 yd. Tractors with rippers scarify the material to depths of 4 in. Then scrapers like these 18-yd twin-engine Euclids load and spread it.

help break up the material, and then it is rolled with a compactor-type 4-wheel roller.

The southerly 4,000 ft of the 10,000-ft runway and 2,000 ft of the apron and taxiway were primarily cut-sections in which the overburden was removed. It was scarified to a depth of 4 in. and recompacted to 100% density.

Fill-sections varied in depth up to an average of 50 in. Subgrade fill material was obtained from grading of runway and shoulders and in the area between the runway and apron. It was deposited in 6-in. compacted layers to 95% of max. density at depths below 30 in. from finished pavement surface, and 100% density in the upper 30 in.

On top of this prepared subgrade material was deposited a 6-in. layer of selected limerock obtained from the limits of grading. It was compacted to 100% density. The finished surface, in most cases, was water-bonded and straightedged to a ¼-in. tolerance in 15 ft. prior to priming.

Equipment being used to accomplish this work is:

- 18 Scrapers, ranging from 7 to 18 yd (Euclid, International, Allis-Chalmers)
- 1 Euclid TC-12 twin-engine tractor
- 3 Allis-Chalmers HD-20 tractors
- 5 Caterpillar D8 tractors
- 1 International TD-24 tractor
- 12 Motor graders
- 7 10-Ton Galion 3-wheel rollers
- 2 50-Ton rubber-tired rollers
- 1 Buffalo-Springfield Kompactor
- 2 2½-yd Northwest draglines
- 1 1½-yd Northwest dragline

Why 4 Reverse Speeds in a motor grader?

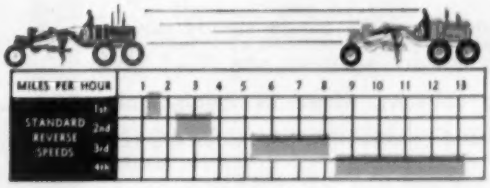
Try an ADAMS and see!

Adams 4 reverse speeds (instead of the usual 2) give you a more flexible speed range for back-up operations—up to 13 mph. This pays big dividends when shuttling back and forth on short stretches, working between forms, etc. Your Adams backs up to starting points quickly, economically—saves production time.

This is only one of the many *plus* advantages that make Adams Motor Graders the most advanced and finest-performing on the market. Others include: 8 Forward Speeds (up to 26 mph.)—Optional Creeper Speeds (low as ¼ mph.)—Easy-Shifting, Constant-Mesh Transmission—Rubber-Mounted Engines—Dual-Braking System.

Adams Motor Graders are available in four popular models, 75 to 140 hp. Ask your nearby Adams dealer to show you the size best adapted to your needs—show you how it can do better work, faster, at lower cost than any grader you've ever owned.

Only ADAMS has 4 Reverse Speeds



Adams 4 reverse speeds range from 1.2 to 13.2 mph.—save you valuable time in shuttling back and forth on short stretches, backing to buck snow drifts, etc.

ADAMS DIVISION • LeTOURNEAU-WESTINGHOUSE COMPANY • INDIANAPOLIS, INDIANA

Make your next motor grader an ADAMS

FLORIDA AIR BASE . . . Continued

1 1½-yd Northwest backhoe
1 20-Ton Northwest truck crane
2 Buckeye ditchers
5 5,000-gal water tankers
3 Sheepsfoot rollers
2 Hyster grid rollers
4 Rubber-tired rollers
2 Service trucks

On the one completed runway, 11,200 ft in length, MC-O asphalt was used for the prime coat and applied to the finished base, after brooming with a power broom supplemented with a blower to remove all loose material. The prime coat was applied with a pressure distributor at the rate of 0.10 to 0.15 gal per sq yd.

On the parking aprons, parallel taxiway, and 1,000 ft on each end of the long runway, warm-up pads and parking aprons at maintenance hangars, a surface-course pavement of tar-synthetic rubber base was used. Reason for using this still-new type of surface is to prevent deterioration of areas due to spillage of jet fuel and blast from aircraft. It is a bituminous concrete consisting of a 2½-in. asphaltic binder course and a 1½-in. tar-rubber surface course.

Specifications for the tar-rubber surface course call for a maximum temperature of 250 deg., with minimum laying temperature of some 200 deg. Approximately 1/10 gal per sq yd of RC-2 cut-back asphalt is required for tack coat between asphalt binder course and tar-rubber surface course.

New Paver Used

Laying of the material is being done with the new Blaw-Knox bituminous paver finisher mounted on wheels with pneumatic tires. Geared for a top traveling speed of 60 fpm, it is equipped with a floating screed and tamper with extension sections for a mix width of 13 ft. This machine, a demonstrator, proved so satisfactory on the job that the contractor placed an order for two additional machines.

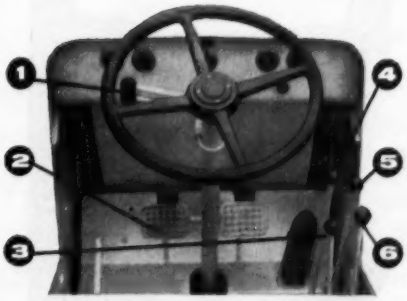
Speed of the paving work is well above normal for this type of paving—averaging 38 fpm in 13-ft strips. The contractor has produced an average of 1,900 tons per 10-hr day.

Two 3-wheel, 10-ton rollers and 2 tandem 8- and 12-ton rollers are being used for compaction. Final rolling is being done by a Bros self-propelled rubber-tired roller loaded to 8 tons.

(Continued on page 86)

motor grader at

Faster, more power,
and LOOK, NO CLUTCH!



It's a pleasure to work here!

1. **Power-shift levers:** for Forward-Reverse and High-Low; make any shift while moving in either direction.
2. **That's no clutch!** It's a double-pedal brake, use it with either foot.
3. **Break-out bucket lever:** work the bucket in the pile—you've got two big double-acting bucket cylinders for tremendous breakout power, independent low-level tip back.
4. **Range Shift:** working or travel speed
5. **Drive Selector:** 4-wheel and 2-wheel
6. **Boom Control**

Until you see a MICHIGAN in action, you won't believe that it's possible to deliver so much power with such ease of operation. Your driver stays at peak efficiency all day long because there's no conventional clutch on a MICHIGAN. Instead, the MICHIGAN's exclusive power-shift transmission does all the shifting hydraulically—and eliminates the most notorious cause of excessive maintenance and driver fatigue.

In addition to effortless, instantaneous shifting, you get up to 300% torque multiplication on a MICHIGAN —from the Clark-built converter. With this kind of smooth, shockless power transmission, you get the full advantage of the MICHIGAN's extra weight and higher horsepower.

A demonstration (on your own job, if you wish) is the only way to get a real understanding of what this machine can do! Just write or call us—and don't forget that all MICHIGAN's are available on the low-cost MICHIGAN Lease Plan.

CLARK EQUIPMENT

CLARK EQUIPMENT COMPANY
Construction Machinery Division
380 Second St., Benton Harbor 28, Michigan
Phone: WA 6-6184

no match for MUSCLES OF STEEL

America's towering dams stand as mighty monuments to the efficiency of modern excavating and earth-moving equipment. On these machines, *muscles of steel*—rugged wire rope—handle with ease and dispatch the tasks that once were back-breaking for man and beast.

Wherever big construction projects are under way, you'll find Wickwire Rope at work—helping to do a better, faster and more efficient job.

Same way—in the mines and quarries ...in the oil fields and logging camps... with the fishing fleets and in materials handling. Here, too, Wickwire Rope has won outstanding preference because of its proved durability and demonstrated reliability and economy.

every industry benefits from wire rope

WICKWIRE ROPE

CF&I PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

THE COLORADO FUEL AND IRON CORPORATION—Abilene (Tex.) • Denver • Houston • Odessa (Tex.) • Phoenix • Salt Lake City • Tulsa
PACIFIC COAST DIVISION—Los Angeles • Oakland • Portland • San Francisco • Seattle • Spokane
WICKWIRE SPENCER STEEL DIVISION—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.) • New Orleans • New York • Philadelphia

2696

1-yd. MICHIGAN takes a heaping bucket-load . . .

The bonus in the bucket pays for this machine fast!

Take another look at the bucket in the photograph. It shows a typical MICHIGAN* bucket-load, heaped-up well over the rated capacity of the bucket—nearly a 50% bonus. Translate this bonus into your daily production and you'll see why a MICHIGAN Tractor Shovel pays for itself fast: you simply move more material with a MICHIGAN.

Tremendous digging ability. Get the bucket blade into hard-to-dig material or under a heavy obstacle and "work" the bucket until you've got a heaping load. The two double acting bucket cylinders are actually powerful enough (if the blade is under an immovable object) to pull the back wheels off the ground! We'll match the MICHIGAN'S digging ability against any make or type of Tractor Shovel, bar none.

Low-level bucket action. You can roll the bucket back only a few inches off the ground—heaping bucket-loads even when the material is scattered only a few inches high. And you can carry the full load *low*—your driver can *see* where he's going, he doesn't have to travel *backwards.*

No clutch—faster cycles. There's no clutch pedal on a MICHIGAN. You can actually shift between Forward and Reverse *while moving:* simply push the hand-lever on the steering column—MICHIGAN'S power-shift transmission shifts instantly. Power-shifting saves time and energy every cycle. Your operators will say: "This sure beats riding a heavy-duty clutch all day!"

See it in action—on your own job. Write us and we'll arrange a demonstration. MICHIGANS are built to handle jobs too tough for other rubber-tired Tractor Shovels—*let us prove it,* without obligation. Write for details on the pay-as-you-go MICHIGAN Lease Plan—you can put these machines to work without laying out a penny of capital.

CLARK EQUIPMENT COMPANY
Construction Machinery Division
380 Second Street
Benton Harbor 27, Michigan
Phone WA 6-6184

CLARK EQUIPMENT

*A Trademark of Clark Equipment Company

FLORIDA AIR BASE . . .

Continued from page 82

The mixing plant is a 6,000-lb batch-type Simplicity S-100 with belt feeder, three dryers, two cold and four hot bins with two dust collectors equipped with sprinklers. It is heated with hot oil and the plant is run manually. Material is being furnished by Asphalt Material Co., Miami.

The Sulfa-Aero-Sealz 3080A, tar-rubber blend was furnished by U. S. Rubber Co. and was blended at the plant of the Reilly Tar & Chemical Co., Rahway, N. J. It was shipped by tanker ship to Port Everglades, 60 mi from the job site, where it was picked up and hauled by tanker trucks to the mixing plant at the project.

The quantities of materials for the bituminous pavement on the project are as follows:

Asphalt cement binder course (2½ in. thick)	214,900 tons
Asphalt cement surface course	29,700 tons
Asphalt cement	3,589,900 gal
Tar-rubber surface course (1½ in. thick)	106,530 tons
Tar-rubber cement	1,408,470 gal

Project manager for Price-Blythe is J. A. Maier. Corps of Engineers' personnel on the project are: resident eng., Lt. Col. John S. Hassell; assistant resident eng., J. B. Rowland; chief of supervision and inspection branch, John Womeldurf; chief of paving and grading section, Frank Robinson; paving engineer, Byron Schumacher; and chief of office engineer, branch, George Marsch.

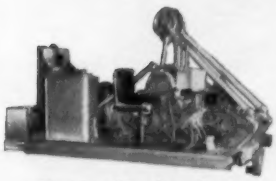
The project is under the Jacksonville, Florida District, Corps of Engineers. Col. E. E. Kirkpatrick, district engineer.

Famous Last Words . . .

(By L. H. Scott, Turner Construction Co.)

"IT'S NOT SLIPPERY HERE!"

Comparison proves the MICHIGAN 3/8-yd. Truck Hoe YOUR BEST BUY



Upper Mechanism

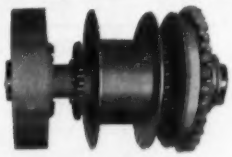
The MICHIGAN® TM-6 is a heavy duty ¾ yd. 7½ ton upper mechanism for mounting on your own truck or at the factory on a new 6x4 or 6x6 truck. The TM-6 is available on the Clark Lease Plan. Write for Bulletin 111.

Power Control

Air Controls are standard on all MICHIGANs . . . fast, smooth, precise, with low operator fatigue. No heavy levers to push or pull—air rams do the actual work.

Smooth Clutches

There's nothing smoother than MICHIGAN air-operated segmented disc clutches . . . and they are self-compensating for heat, self-ventilating and self-cleaning. All segments are interchangeable.

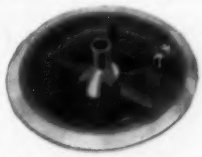


Power Load-Lowering

Four shafts on the TM-6: Swing, Hoist, Intermediate and Crowd . . . each with its independent clutches. For precision crane work, the hoist line can be reeved on the front drum to provide Power-Up and Power-Down.

Hook Rollers

You can swing the boom by leaning against it. There are 5 ball bearing-mounted adjustable rollers on the TM-6 . . . grease twice a year. Most other ⅜-yd. machines have only 3 rollers, bushing-mounted.



Cast Steel Circle Gear

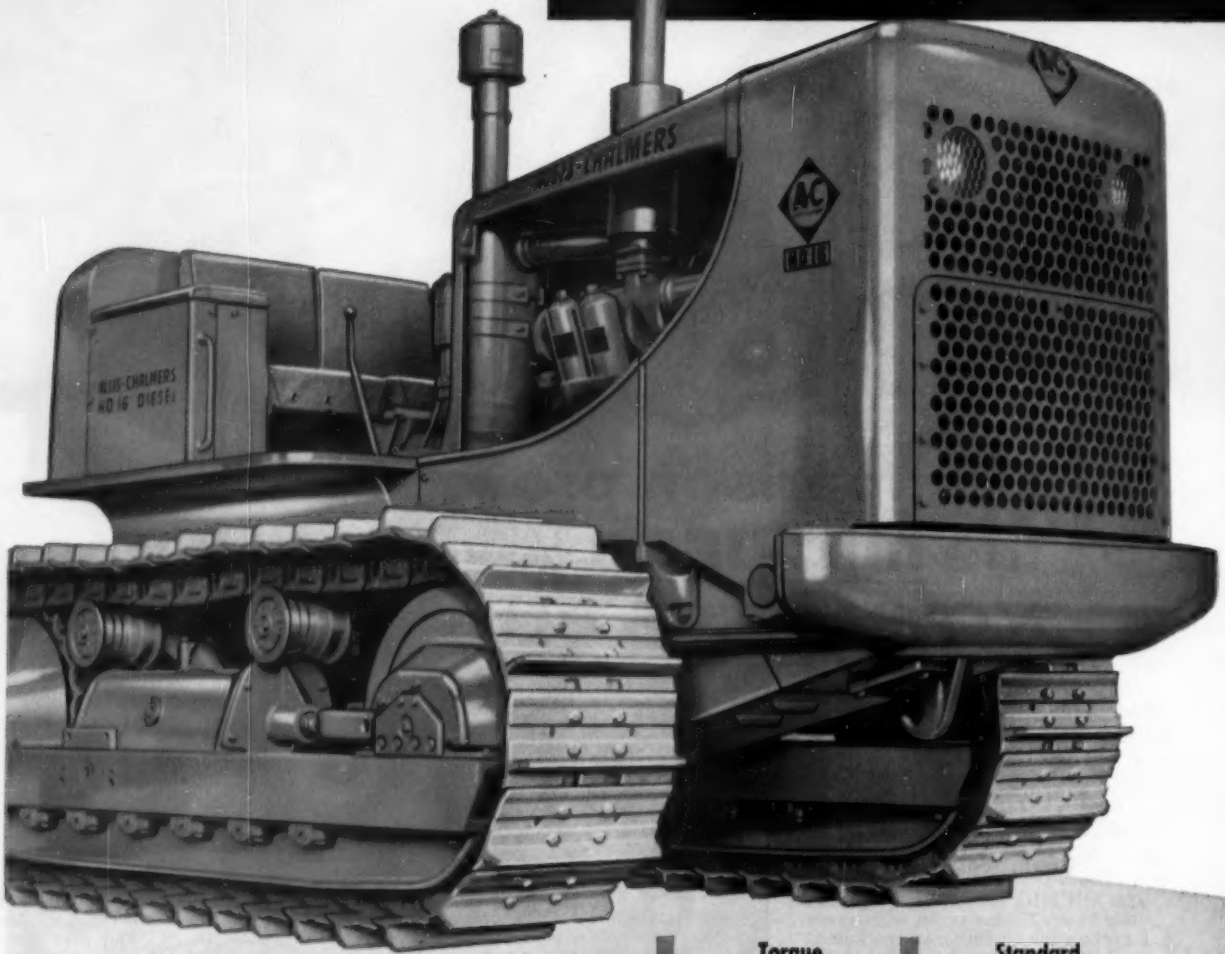
Center post and circle gear is heavy one-piece casting of alloy steel. Pinion gear is cut from alloy steel for smooth, quiet operation. Roller paths are machined to a smooth finish, top and bottom.

Write for 12-page booklet, "More Yardage through Air Power" which documents the operating and maintenance advantages of MICHIGAN air controls.

CLARK EQUIPMENT

CLARK EQUIPMENT COMPANY
Construction Machinery Division
380 Second Street, Benton Harbor 31, Michigan
Phone: WA 6-6184

Allis-Chalmers presents the NEW HD-16



Your choice of two outstanding drives

	Torque Converter Drive	Standard Transmission Drive
Horsepower	150 net engine hp	131 belt hp
Weight	31,600 lb	31,500 lb
Drawbar pull	up to 60,000 lb *	up to 35,945 lb *

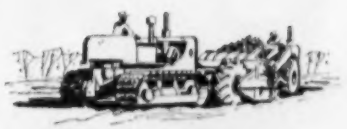
*Limited, under normal tractive conditions, to 90 percent of total weight of tractor and mounted equipment.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

NEW STANDARDS OF PERFORMANCE

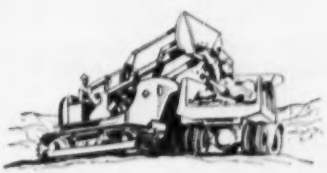
for a wide range of heavy-duty work

Set your sights on an HD-16! This big new tractor not only brings you *more* power for bigger jobs . . . it makes more effective use of horsepower, with a brand new Allis-Chalmers diesel engine and your choice of two new drives — the job-proved torque converter or the easy-shift standard transmission. Either way, the HD-16 brings you a new high in tractor-operator efficiency . . . a new high in work done under even the toughest conditions.

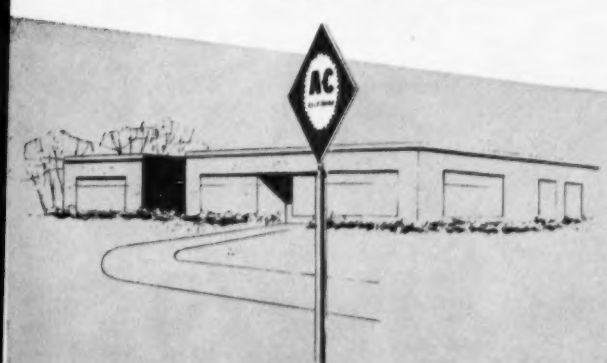


NEW STANDARDS OF DEPENDABILITY AND LONG LIFE

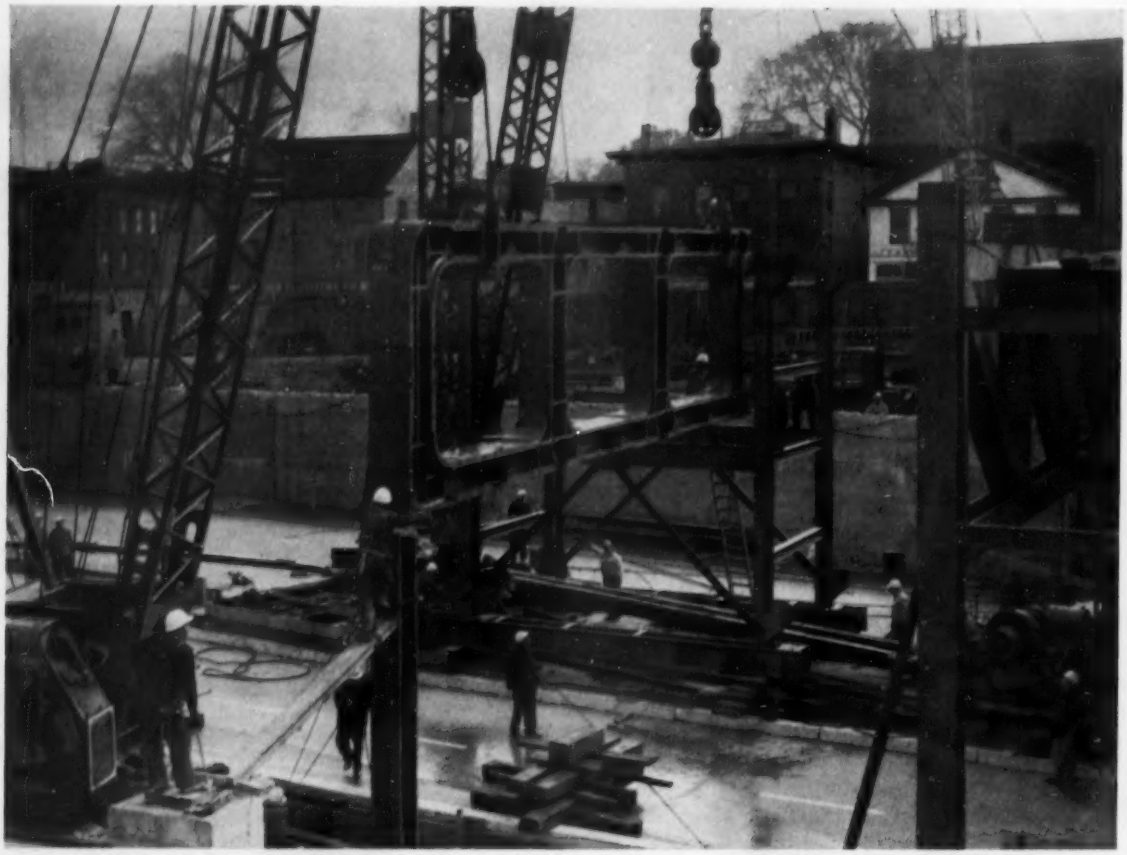
under ***all*** conditions!



The HD-16 follows the Allis-Chalmers *advanced basic design*, with such important features as its all-steel, Box-A main frame and one-piece steering clutch and final drive case . . . straddle-mounted final-drive gears with tapered roller bearings . . . unit construction . . . simplified lubrication and service designed with *better* maintenance in mind. What's more, it is newly engineered throughout to provide big safety factors in all components . . . plus outstanding new features like the new Allis-Chalmers heavy-duty diesel engine, new "wrap-around" radiator guard, husky new transmissions, new true-dimension track, and many others.

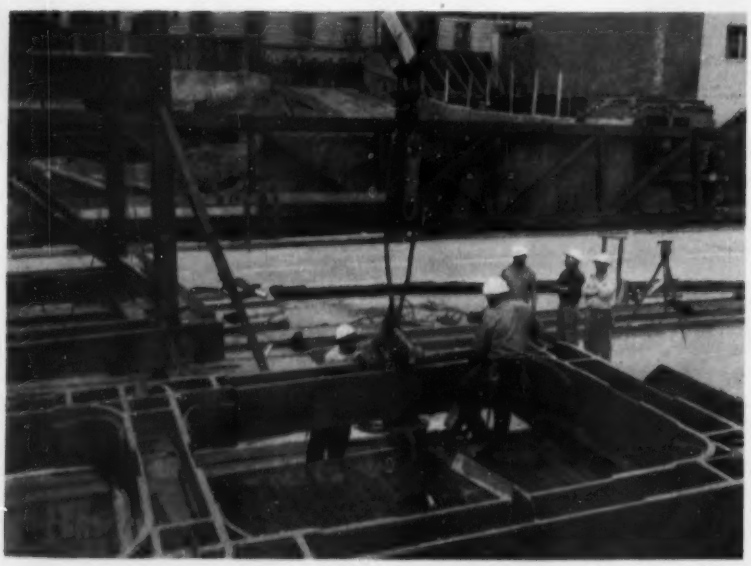


All in all, the new Allis-Chalmers HD-16 brings you an outstanding combination of performance and long life with both mounted and drawn equipment . . . a higher rate of production, more working time, more work done, LOWERED JOB COSTS. You OWE it to yourself to get all the facts now from your nearby Allis-Chalmers dealer.



FIFTY-ONE-TON VIERENDEEL TRUSS-SECTION is eased on to bolted steel cribbing by 50-ton Manitowoc crane and 35-ton guy derrick. Cribbing on highway median strip to allow traffic on either side, supports truss until halves are spliced together.

Highway-Topped Culvert Complicates

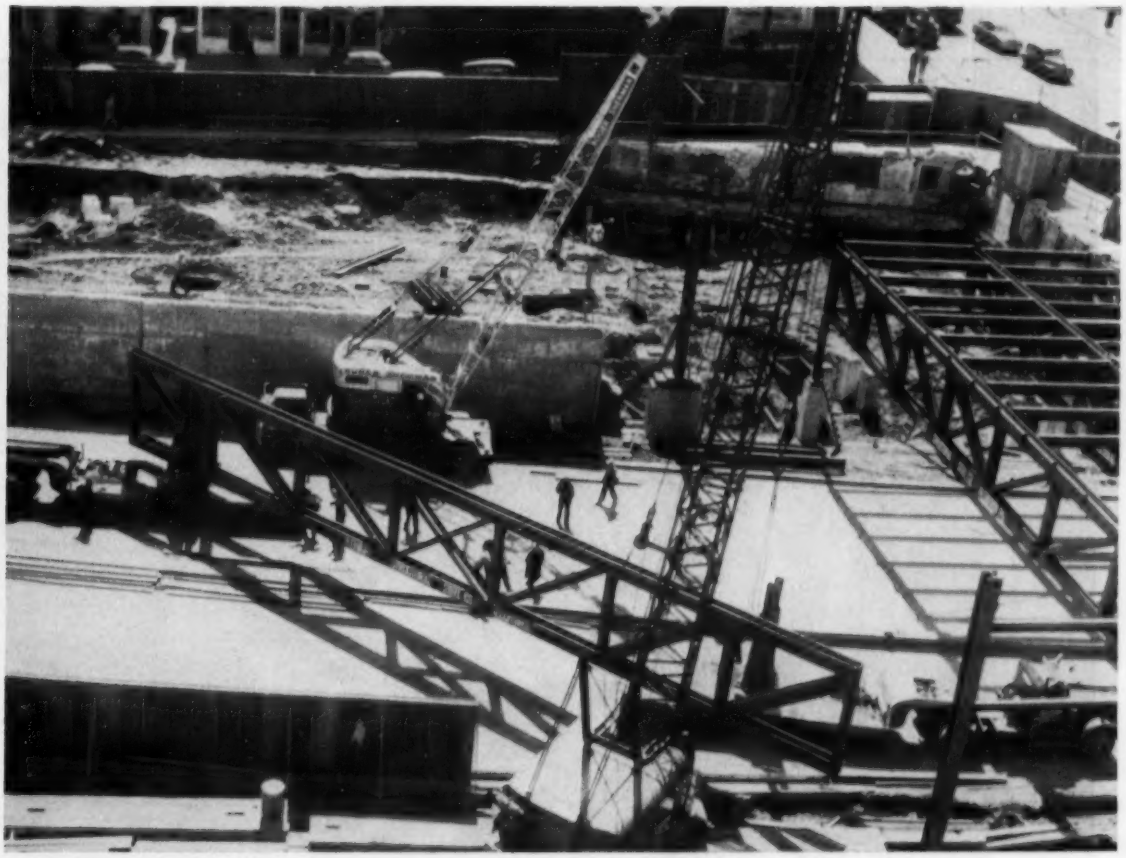


LARGE STEEL CLIP AND SHEAVE ASSEMBLY suspended from crane hoist line is bolted around top chord to turn heavy Vierendeel truss sections upright.

MANY CONTRACTORS have erected bridges over busy highways. However, not many have constructed a building over a highway—particularly over a six-lane highway that is really the top of a large box culvert. That's what's being done on a new public library in Hartford, Conn.

The library is to be of all-welded steel construction, supported on steel H-piles and reinforced concrete foundations to rock. Ten trusses span the highway to support the three-story plus penthouse building.

Five of them are Vierendeel trusses. Two of these, 104 ft long and weighing 94 tons each, are believed to be the largest and heaviest ever erected in this country. (This type of truss is being used because it has large open panels with no diagonal members. These open spaces will be used for book storage in the library.)



CONVENTIONAL TRUSSES ARE LIFTED and rotated into position by Manitowoc and Bay City cranes working together. Swivel-mounted bolsters hold trusses upright on low-boy trucks during trip to site but allow the trucks to turn freely.

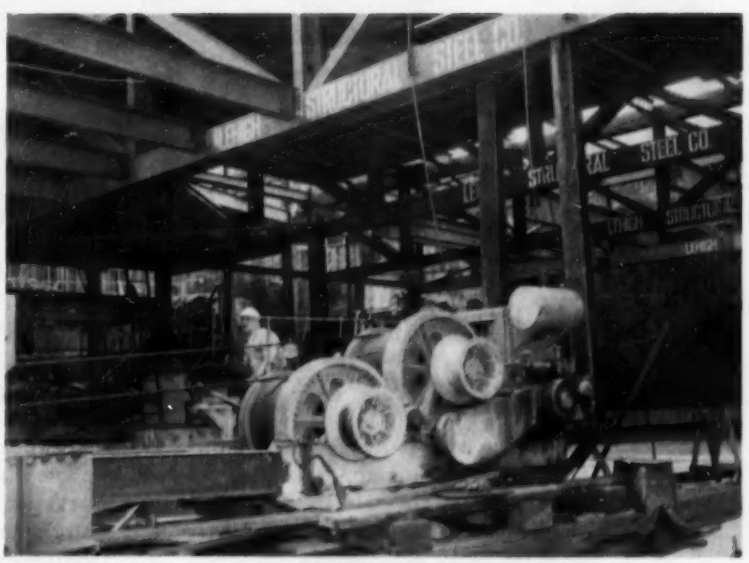
Unusual Building Erection Overhead

The steelwork contractor, Lehigh Structural Steel Co., fabricated the Vierendeel trusses in its Allentown, Pa., plant from plates rather than structural sections, because of their size. Welds as large as 4⅜ in. were needed.

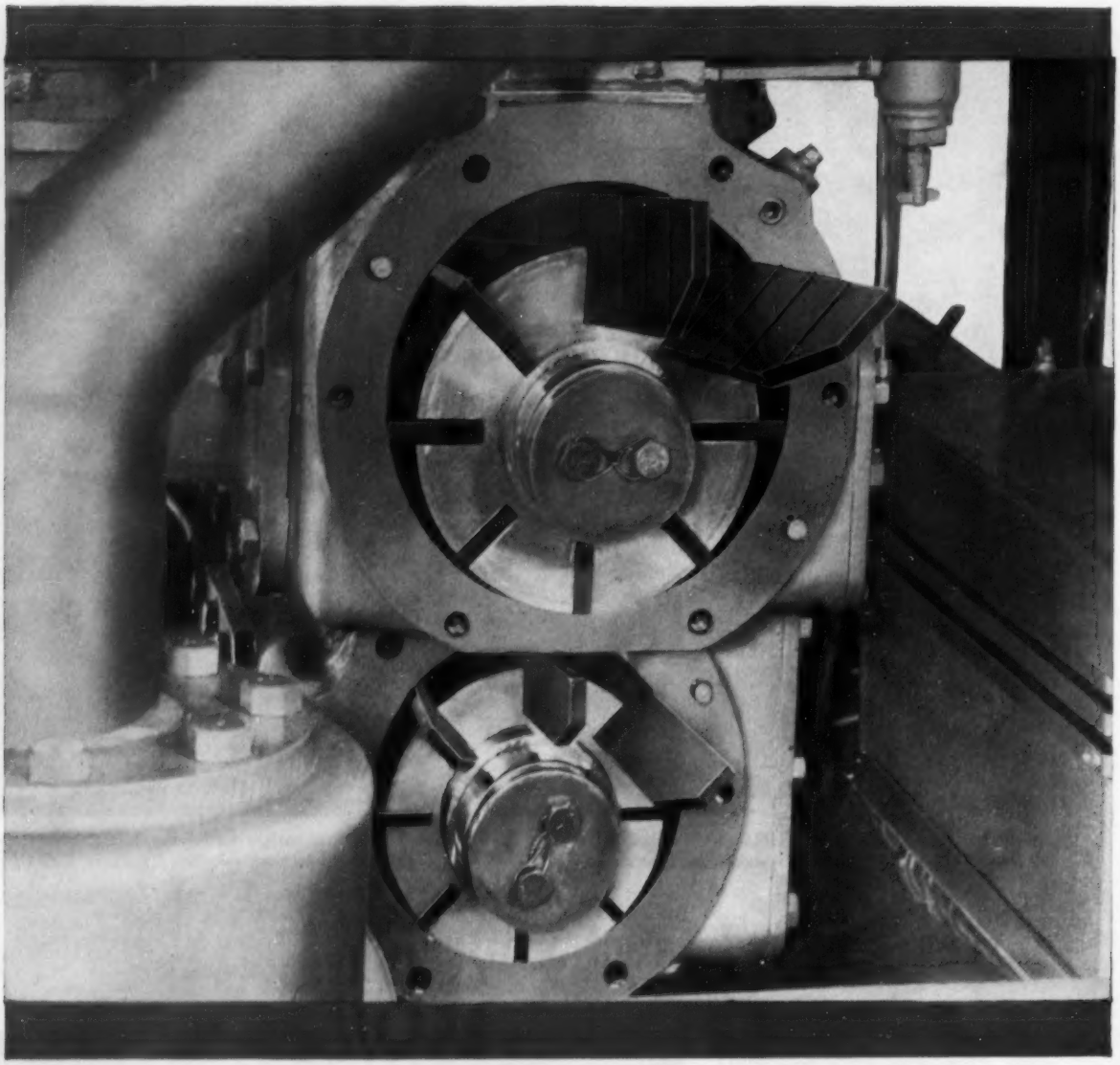
Because of their large size and weight, the Vierendeels posed a number of shipping problems. Separate sections had to be shipped in separate rail cars, lying flat instead of standing upright as would normal trusses. At Hartford, the trusses were transferred to low-boy trucks.

The trusses arrive on the site lying flat on the trucks. Lehigh developed a device consisting of a large steel clip slung from a sheave to help turn the trusses upright. The righting clip, which is bolted around the truss top chord, is suspended from a crane's hoist line by the rope over the sheave. The rope

(Continued on page 95)



SKAGIT HOIST placed on median strip out of traffic, powers 35-ton guy derrick. Stone masonry bridge in background, built in 1833, will support part of building load.



super simplicity

an outstanding advantage of the new water-cooled Gardner-Denver Rotary 600

In minutes only . . . your own compressor man . . . with his regular tool kit . . . removes all compressor blades for inspection or replacement . . . right on the job. Saves time. No tricky adjustments.

Remove a dozen cap screws . . . off come the end plates . . . out slide the blades . . . and bearing assemblies are not disturbed. That's super simplicity . . . one of many outstanding advantages engineered by Gardner-Denver to keep the new Rotary 600 delivering air when you need it.

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Automatic water-cooling maintains best operating temperature regardless of the weather.

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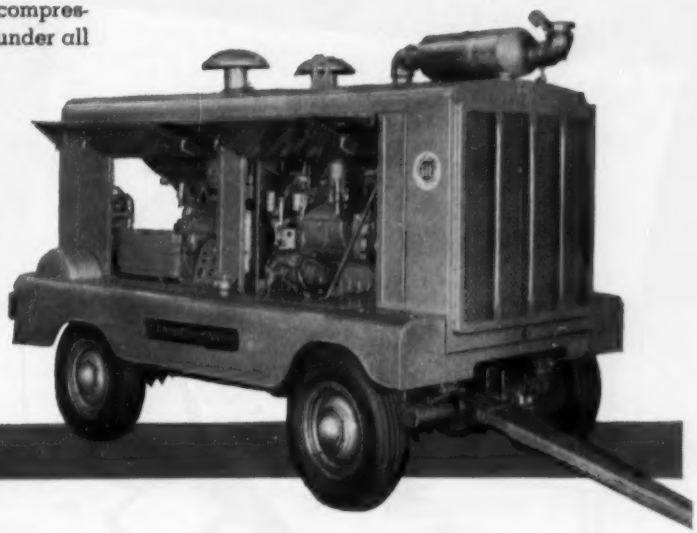

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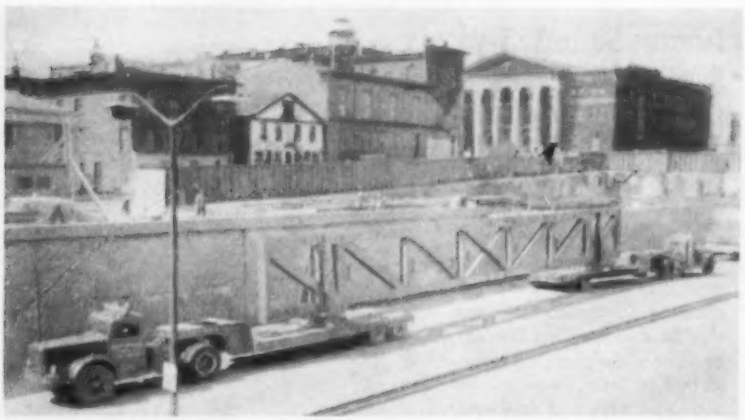

LENGTH OF CONVENTIONAL TRUSSES makes it necessary to transport them to the site on two trucks in tandem, the first truck driving forward while the second backs.

STRUCTURAL CONNECTIONS in the all-welded building are being made by four 400-amp Lincoln welders and five 400-amp A. O. Smith selenium rectifier units. Two-level hung stand allows welder to work comfortably in awkward locations.

runs over the sheave as the truss rights itself. Wire rope chokers which might be frayed or cut by the truss members are eliminated.

The Vierendeels are being erected by a 50-ton Manitowoc 3000 Special crane (70-ft boom and 30-ft jib) in cooperation with a 35-ton guy derrick (100-ft mast and 90-ft boom). The derrick is powered by a Skagit hoist with a Chrysler engine. Because of the weight of the five Vierendeel trusses, they are erected in halves and supported in splicing position by bolted steel cribbing.

The erection of the five conventional trusses is somewhat less of a problem. Being considerably lighter than the Vierendeels, they are erected in one piece. Their size, however, makes it necessary to transport them to the site by two low-boy trucks traveling in tandem, one driving forward while the second backs. A swivel-mounted bolster holds the truss erect while allowing free turning of the trucks. The first four conventional trusses were erected by the Manitowoc crane in cooperation with a Bay City Cranemobile. It is anticipated that the remaining first floor truss will be set by the Manitowoc and the 35-ton derrick.

The structural limitations of the box-culvert supporting the highway necessitate careful planning of the movements of the derrick, the cribbing and the truss-bearing trucks, in order that their loads shall never exceed that of a 20-ton truck (H-20 loading). Traffic can only be halted on the six-lane highway for a period of 6 hr, and then only upon 48 hr notice, further restricting the movements of the contractor.

Supervising the project for the City of Hartford are: Daniel J. Tasillo, supervising architect; R. W. Loomis, structural engineer; Schutz & Goodwin, project architects; and Clyde Driggers, resident engineer.

A. Swanson is superintendent for Wadhams & May Co., general contractor. D. Lonergan is erection engineer and F. Servier, superintendent for the Lehigh Structural Steel Co., Allentown, Pa.

Johnson 50 to 125-yd. Roadbuilders plants

Flexible All-Welded Roadbuilders Bin gives you a portable batch plant for 2, 3 or 4 aggregates, or converts to transit-mix (shown) or central-mix plant for bulk cement and 2 or 3 aggregates. Can be equipped with 1 or 2 multiple material Hi-Speed Batchers, size 34 Roadbuilders Batcher, or truck-mixer charging batcher in 2 to 5 cu. yd. sizes. Bin available with 2, 3 or 4 compartments, 50 to 125 cu. yds. Also: silos, elevators, buckets.

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7-second discharge with Kwik-Mix 11-S

Saving important seconds on every batch of concrete, tilted Flow-Line Discharge Chute pours full 12.1 cu. ft. batch in 7 seconds. Kwik-Mix 11-S Dandie® also has side or end discharge, 2 or 4 wheels, and special tower attachment. Other sizes: 3½-S to 16-S. Also check Kwik-Mix bituminous, tilt and non-tilt plaster-mortar mixers . . . and Moto-Bug® (power wheelbarrow) shown here. Ask your Kwik-Mix distributor for all facts.

KWIK-MIX • Milwaukee, Wis.
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25 feet per minute with 150 Trenchliner®

On drainage, irrigation and utility trenching, 150 wheel-type Trenchliner digs 16 to 26 inches wide, at depths to 5¾ feet. Hydraulic wheel-hoist maintains close grade tolerance. 30 digging feeds range from 12 inches to 25 feet per minute. Has square or round-bottom buckets; gumbo lips or "Tap-In" teeth; 16 or 12-inch crawlers; gas or diesel power. Tile box and chute optional. Parsons line includes 5 other models, all sizes and types.

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2,651 TONS OF STRUCTURAL STEEL are going into this 11-span continuous-girder viaduct, supported by heavy concrete piers. When completed, the 1,483-foot overhead roadway will have 4½-inch steel grid flooring, filled and covered with concrete 5 inches thick. Koehring 1005 crane, with 70-foot boom, handles the heavy lifts—30-foot jib gives extra reach.

How much will it lift?

Check Koehring lift capacities:

205 CRAWLER	(½-Yd.)	20,000 lbs.	30-foot boom at 10-ft. radius
205 ON RUBBER	(½-Yd.)	30,000 lbs.	25-foot boom at 12-ft. radius
304 CRAWLER	(¾-Yd.)	27,800 lbs.	35-foot boom at 12-ft. radius
304 ON RUBBER	(¾-Yd.)	50,000 lbs.	30-foot boom at 10-ft. radius
405 CRAWLER	(1-Yd.)	40,000 lbs.	40-foot boom at 12-ft. radius
605 CRAWLER	(1½-Yds.)	72,300 lbs.	50-foot boom at 12-ft. radius
1005 CRAWLER	(2½-Yds.)	159,000 lbs.	50-foot boom at 12-ft. radius

CK555

KOEHRING COMPANY, Milwaukee 16, Wis. (Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load.)

2

TWO FOR THE ROAD

Watch a new highway under construction and chances are that Berger Instruments—like these latest model transits—are marking them out precisely—the 6¼" transit for the most exacting requirements; Polara for the less complex. Just as so many Bergers have been doing for over 84 years everywhere in the world—on roads, large and small buildings, bridges and every type of construction project.

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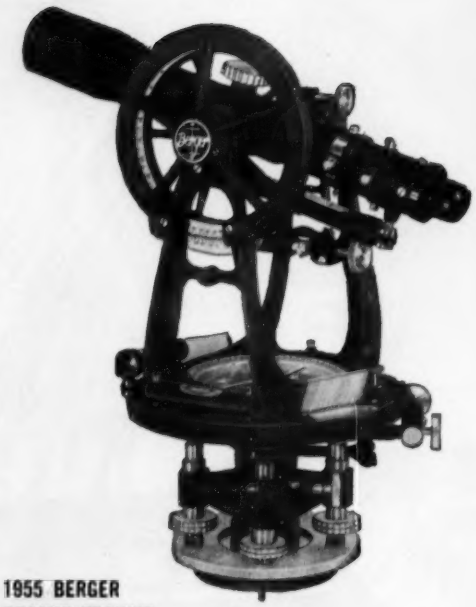
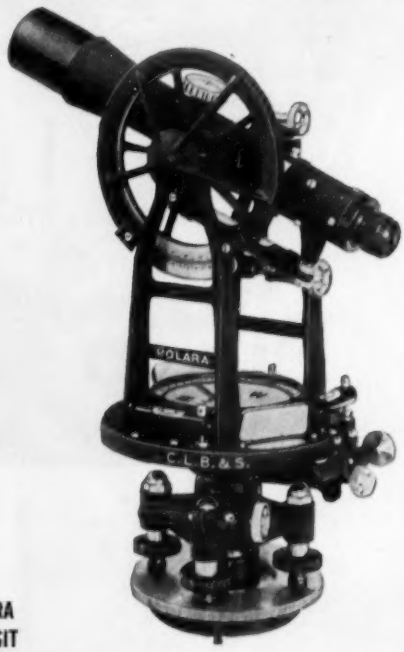


1955 BERGER BRONZE TRANSIT

Supreme achievement of 84 years of instrument making. Newly designed optical system, 6¼" transit has 26 power telescope, coated optics, resolving power 3½ sec., effective aperture 1.430 inches (36mm), field of view 1 deg. 6 min. Fully enclosed nickel silver leveling screws, replaceable bronze bushings, 3¾ ft. short focus. Reversion vial included. Mahogany transit case and white ash tripod at no extra cost.



POLARA TRANSIT

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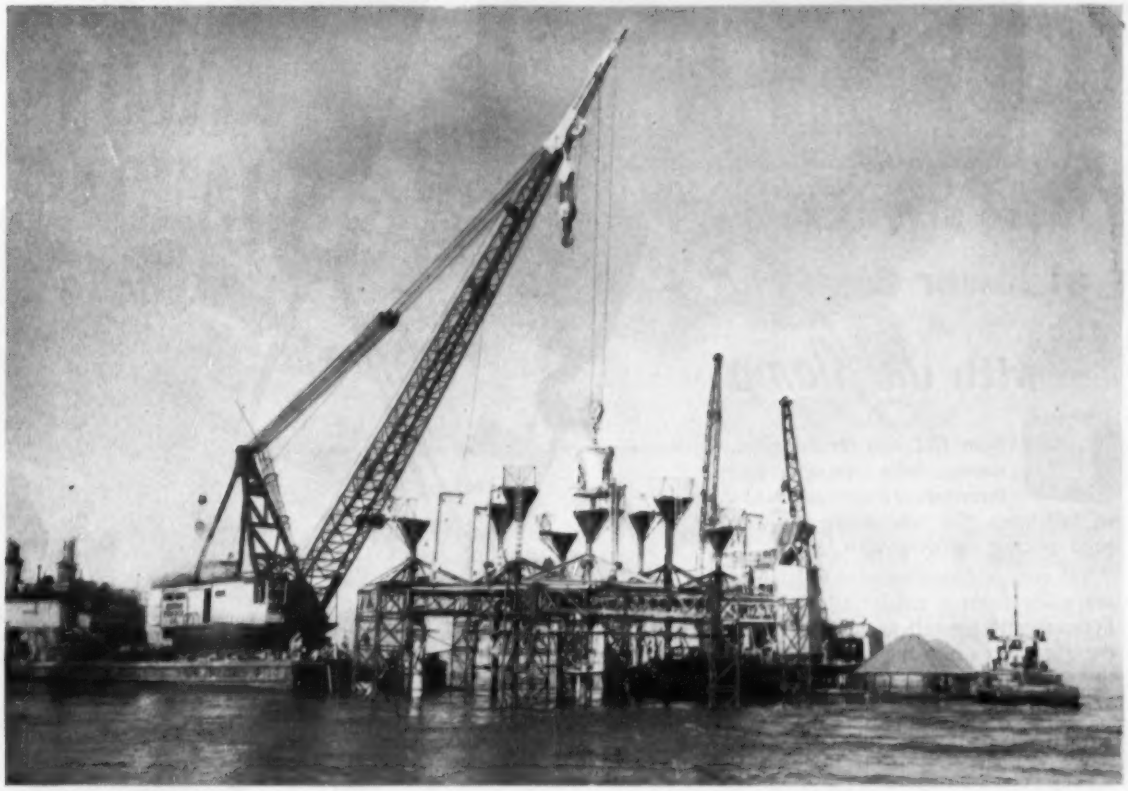
CONCRETE MIXING AND PLACING



TREMIE CONCRETE for unusual bridge substructure is poured by multiple tremie-pipe setup served by floating concrete plant and whirler crane. Tremies are raised by winches and lines on frames that guide the pipes. Bucket gates are air-controlled.

TREMIE PIPE handled by crane is fed by Pumpcrete line. It's adding weight to a tube-type tunnel section to sink it.

13. Underwater Concreting

By A. K. BURNHAM, Jr.

New York Project Manager, Marine & Heavy Construction Dept., Merritt-Chapman & Scott Corp.

DEPOSITION OF CONCRETE under water is a common method of (1) sealing cofferdams and caissons of most any shape and size, (2) placing mass weight in or on objects to be held under water, such as the sinking of precast tunnel sections, and (3) building all types of subaqueous foundations.

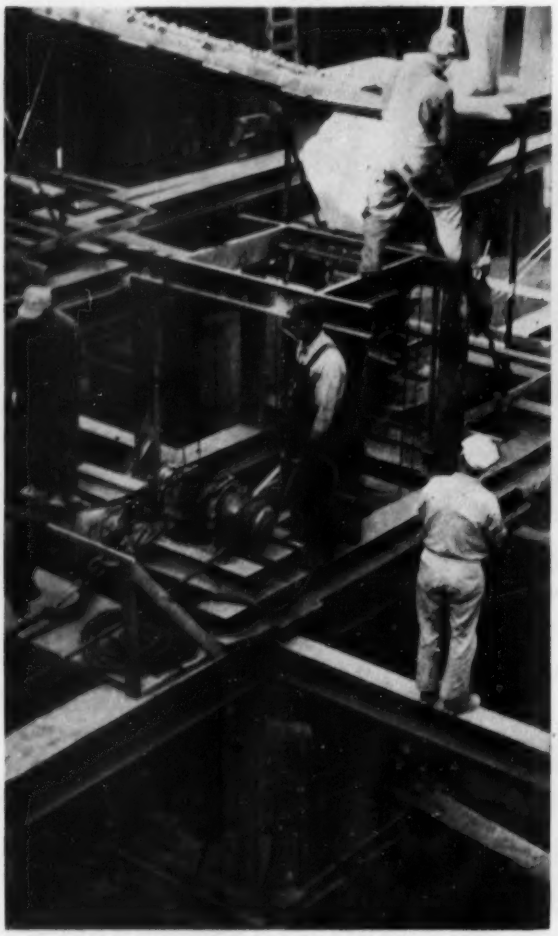
Most under-water concrete is placed through a vertical pipe extending to the pour from above the water surface. It can also be placed under water satisfactorily by special buckets, by lowering it in burlap sacks, by pumping it directly to place or by placing the aggregate first and then grouting it.

Tremie Concrete

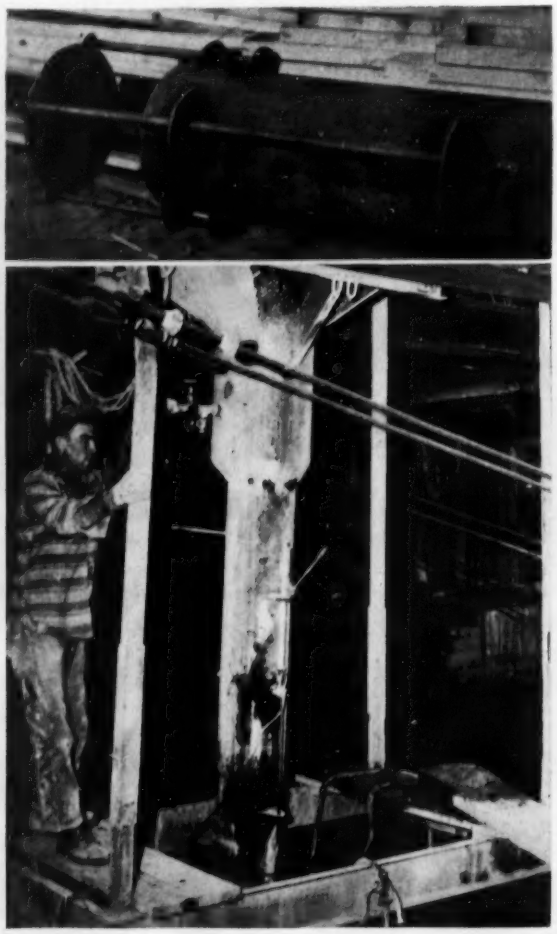
Tremie concrete is that which is poured through a steel pipe whose upper end is fitted with a hopper to receive the mix. (Indeed, the word derives from the French *tremie*, or hopper.) Dimensions of

(Continued on page 102)

CONCRETE . . . Continued from page 99



SLIDING FRAME supports tremie pipe that is pouring 8-ft concrete seal in cofferdam. Air tugger raises and lowers tremie, while line from its winch-head skids assembly along track beams.



FOOT VALVE (top) can be closed by lines to two small jacks on pipe, so maintains seal when moving. Air inlet near top, below an internal flap valve, lets pipe be blown out for initial seal.

pipe and hopper are adjusted to job conditions. Generally, however, tremie pipes are 12-in. extra heavy steel. And it is strongly recommended that no pipe under 10 in. be used, in order to prevent concrete from plugging it.

Tremie pipes are usually handled by cranes or derricks that lower, raise or move them as required by the pouring operation. Some large pours have been made by tremies riding in hoist towers on the edge of barge decks, however. And others have been made by winch-handled tremies mounted on framework spanning the cofferdam.

In placing tremie concrete it is necessary that a continuous seal be maintained at the base of the pipe to prevent water from mixing directly with the concrete and washing out the cement. No special concrete mix is required. It is not necessary to pour an extra-

HOIST TOWERS mounted on side of railroad car-float handle 75-ft tremie pipes that are pouring floor of drydock under water. Operators riding platform attached to each tremie-hopper control flow of concrete by means of gates. In 5½ months, 500,000 yd were placed.

PHOTO COURTESY HARNISCHFEGER CORPORATION, MILWAUKEE, WISCONSIN

Flexibility of Modern Chrysler High-Speed Industrial Engines Proved in 375 Ampere Arc Welder

Here pictured in construction is a New York City garbage disposal dump located on the North River near 135th Street. When completed, trucks will drive up its ramps and discharge loads into cubicles located over scows. Scows will then convey refuse to a watery grave.

On this job, three P&H WN-302 Arc Welders have been putting in five 8-hour days every week welding cubicles, not only joining steel members but also giving them added strength for years to come. Chrysler Ind. 30 Engines power Harnischfeger 375 Amp. Welders supplying enough extra power to compensate for possible generator loss and still provide reserve for overload.

Within their 230 to 413 cubic inch displacement range, Chrysler Industrial Engines offer the high-speed performance construction equipment demands. Each engine is a compact, relatively small unit which will permit installation in virtually any type of construction equipment regardless of size or silhouette. Besides size, weight and cost advantages, should it become necessary, Chrysler Industrial Engines offer fast, easy parts replacement service with dealers located all over the country.

In considering power for your equipment, remember Chrysler offers its industrial engines built to meet the needs of the equipment with such items as gyrol Fluid Coupling; Chrysler Industrial Torque Converter; 3-, 4- or 5-speed transmissions; heavy-duty clutch and power takeoff; velocity, belt or gear-driven governors; gas, butane and propane burning carburetors available for factory installation.

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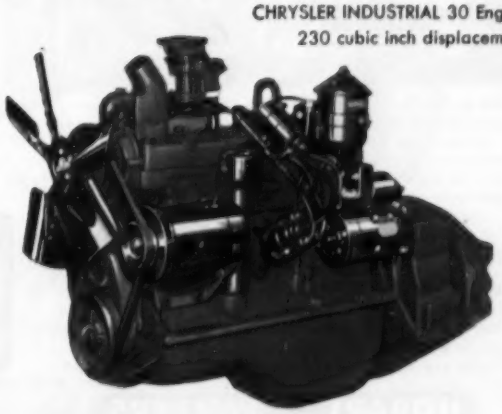
CHRYSLER INDUSTRIAL 30 Engine
230 cubic inch displacement



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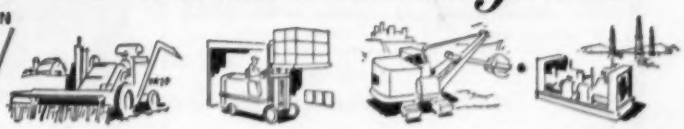
HORSEPOWER  WITH A PEDIGREE



AGRICULTURE • INDUSTRY • CONSTRUCTION • OIL FIELDS

CONCRETE . . . Continued

rich mix to obtain the required strength, because there is only minor cement loss if the seal is constant.

Depending on location, a slump of 5 to 7 in. is most practical for tremie operations. It has also been found that through use of certain retarding densifiers and air-entraining additives, the slump can be lowered greatly. This also reduces to a minimum the loose material and laitance that result when the pour is topped out.

Tremie Seals

When starting a tremie pour, it is necessary that the pipe be sealed to prevent the concrete from dropping through water. This initial seal can be obtained in several ways. Among them are wooden plugs, burlap sacks and mechanical valves.

• **The wooden plug** is usually a rubber-gasketed laminated disk or plate about 2 in. greater than the diameter of the tremie pipe. A cable normally is attached to the plug so it can be recovered later from above water once the final seal has been made. The plate is placed against the bottom of the pipe before lowering into the water, and water pressure holds it there until the pipe is on bottom. Next, concrete is placed in the empty tremie until a sufficient charge builds up in the hopper so that, upon raising the tremie slightly, the concrete will push the plate aside. The concrete then runs free through the pipe and forms a pro-

TREMIE HOPPER should be kept just about this full for best results, balancing concrete inflow with outgo through tremie.

tective layer of concrete around the mouth that precludes any water entering the pipe.

• **A burlap sack** filled with hay makes a simple seal. Unlike the wooden seal, however, the sack is placed after the tremie pipe has been lowered into the water. The sack is introduced into the pipe at the base of the hopper, in which concrete is then poured. The sack, driven down by the concrete, pushes water out of the pipe ahead of it.

• **Various mechanical valves** attached to the foot of the tremie pipe have been experimented with. However, in general practice they are more expensive and troublesome than other methods, so are not extensively used.

Once the initial seal has been established around the foot of the tremie pipe, it should be maintained throughout the pour. To do this, the pipe bottom is kept embedded in the rising concrete to such a depth that the level of concrete in the pipe never is allowed to fall much below the base of the hopper. (Depth of embedment for 7-in. slump concrete and a 12-in. pipe would be about 3 ft.) Best practice is to balance flow from the pipe with inflow of concrete into the hopper. This is far more efficient than filling the hopper full, raising the tremie violently to let the concrete go out, then plunging it down into the pour to stop the flow before the seal is lost.

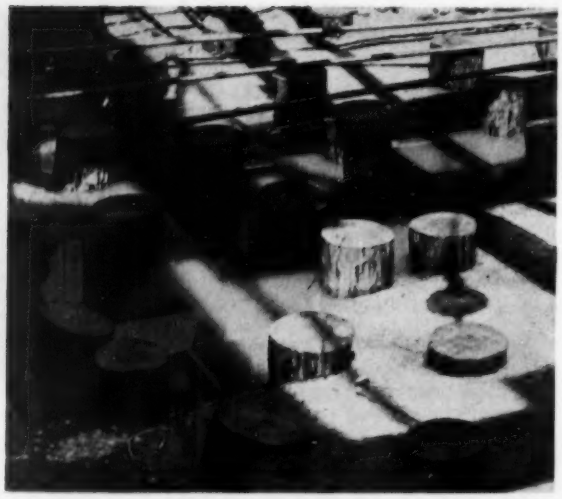
Tremie-Concrete Flow

It is quite easy to fill a cofferdam or caisson to any predetermined elevation by controlling the flow of the tremie concrete. The distance the concrete will flow horizontally is determined mainly by the depth of the pour and the consistency of the mix. With sufficient head to maintain an even flow, and with a 5- to 7-in. slump, concrete can be moved as much as 100 ft from the tremie pipe. Slight lateral movement of the tremie pipe at its original location can more or less determine the ultimate flow.

It has been found that one tremie pipe in one location can make the usual bottom seal pour in a cofferdam of nominal size (say 35x90 ft). If it is placed one-third the distance from one end, and in the middle transversely, the entire seal can be poured from that spot, with the possible exception of a few yards to level off the far end.

With proper consistency of the

STEEL AND WOOD PILES can be encased easily and tightly in tremie concrete, such as these two different cofferdam seal pours for bridge foundations. Distance tremie concrete will flow horizontally is determined mainly by depth of pour and consistency of the mix.



concrete, cofferdams having steel H-piles driven in the bottom can be successfully poured from one point. The concrete will completely encase the pile sections, without voids even at the back corners of web and flanges, and with no indication of leakage following cofferdam dewatering.

It is sometimes necessary to remove and replace a tremie pipe during the course of a pour; when bracing interferes with lateral movement, for example, or when the pipe must be shortened as the pour rises. However, if the operation is handled carefully, there is very little washout of cement and no loss in the value of the concrete.

Largest Tremie Pour

Probably the largest cofferdam seal pour ever tremied—26,670 cu yd—was made by Merritt-Chapman & Scott Corp. for an anchorage at the Delaware Memorial Bridge. The pour, 100x220x32 ft

"DOWN-TO-EARTH PERFORMANCE WITH CITIES SERVICE LUBRICANTS"

"Up to 12,000 hrs. before overhaul with Cities Service C-300 Motor Oil," says Delmar Rowe.

For the last 30 years, Delmar Rowe has been building roads. And for the last seven years, Cities Service Lubricants have paved his way to greater profits. The firm is Rowe Construction Co., Bloomington, Illinois... and since 1925, it has not only built countless roads, but has also reclaimed land, supplied gravel, and constructed sewers and water mains throughout the Bloomington area.

Rowe's choice of Cities Service Lubricants was no hit-or-miss proposition. "At that time," he says, "I'd had 23 years observing down-to-earth lubrication problems with construction machinery... and I was determined to find lubricants that gave the down-to-earth performance to solve these problems. Cities Service supplied the answer."

HOW RIGHT WAS ROWE? His Cat motors are a good example. They now run as long as 12,000 hours before overhaul using Cities Service C-300 Motor Oil. He reports: "There's no sludge or carbon problem and bearing life has been excellent. Other pieces of equipment show similar results. Obviously, we're saving on maintenance costs, and obviously it's showing up in the profit column."

Delmar Rowe is but one more construction man who's found Cities Service Lubrication the road to increased efficiency, lowered costs. Why not learn what it can do for you? Contact your nearest Cities Service representative or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

Tough Jobs for Tough Machines. Rowe has 50 pieces of heavy machinery constantly at work, including 8 drag line cranes, 2 crushing plants, 4 bulldozers, 5 end loaders and 28 cars and trucks.

One of Rowe's 19 Dump Trucks fills up with Cities Service Gasolene...a powerful treat for a hungry engine. Rowe also uses Cities Service Diesel Fuels, C-300 Motor Oil, and Trojan Greases.

CONCRETE . . .
Continued

deep and starting 72 ft below water, was handled by just two tremies in a continuous 172-hr operation.

The five-sack tremie-concrete mix was placed in four 8-ft layers by two floating plants, one on each side of the cofferdam. Pouring started at one end, and the first 8-ft layer was carried 220 ft to the far end by moving the tremie pipes in 50-ft jumps. At the far end, concrete was built up to a 16-ft depth, and the second 8-ft layer was carried back to the original starting point. Two more simliar passes brought the pour to the required 32-ft depth.

Bucketed Concrete

Concrete can be placed at great depths under water (240 ft at the San Francisco-Oakland Bay Bridge, for example) by special buckets. The bucket is carefully lowered until it rests on the bottom, then its gate is opened either by air or by a trip line to the surface.

Under-water buckets should have a restricted top opening, or preferably a means for closing the top almost completely, to prevent cement from washing out of the concrete as the bucket is lowered. Canvas flaps have been used successfully as top closures.

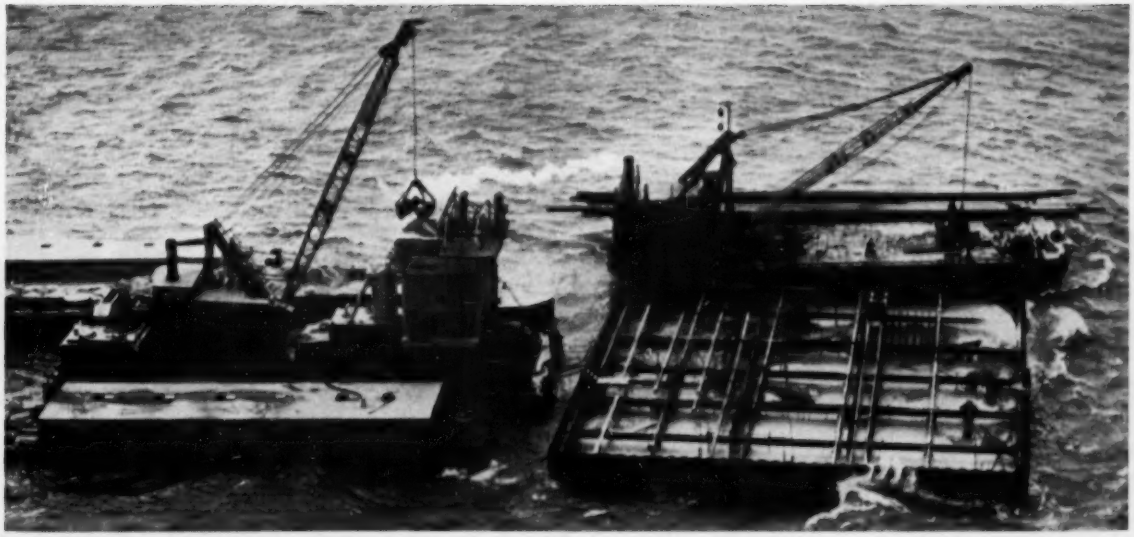
Under-water buckets should also be fitted with a lip extending below and around the bottom. The lip protects the gate when the bucket is landed on previouly placed concrete, and also helps prevent wash-out of cement when the bucket is dumped and raised.

Pumped Concrete

In a few instances, concrete has been placed under water directly through a Pumpcrete line. The line itself acts much like a tremie pipe, being plugged to start off with and then kept sealed in the poured concrete. However, it has been found difficult to handle the heavy, awkward pipe and to maintain an adequate seal while shortening the line.

Sacked Concrete

As late as 1926 concrete was being placed under water by the sack method. Such sacks, composed of heavy tarpaulins containing as much as 50 tons of concrete sewn into bags, were gently lowered into final position. However, it was



GROUTED-AGGREGATE CONCRETE builds pier. Coarse aggregate has been dumped into sheetpile form, and special grout is being injected into it from plant at left. Pumped through pipes placed before aggregate, grout fills all voids as it rises.

quite difficult to obtain anything but a general shape of non-homogeneous mixture. Concrete in burlap sacks has also been placed individually by diver, but neither of these methods is in general use today.

Grouted-Aggregate Concrete

An under - water concreting method that has become more general in the present day is grouted aggregate. This entails placement of coarse aggregate in the cofferdam or form to the required height of pour. Then, through a series of pipes placed prior to aggregate and extending down to the bottom, a grout is forced in to fill the voids.

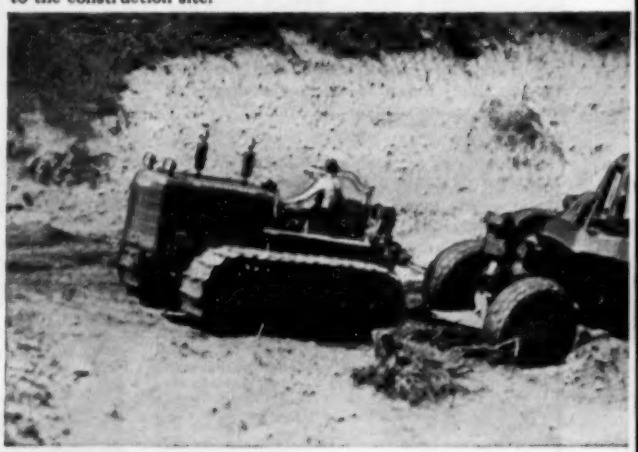
Grout for this work is usually

(Continued on page 112)

DAM FOR CORDRY LAKE, 700 feet thick at the base, is built by this fleet of three INTERNATIONAL TD-18A crawlers and scrapers and one INTERNATIONAL TD-14A with hydraulic dozer used for push-loading on inclines and in soft spots, and some other equipment.

LAKE LEAKAGE is eliminated by removing all porous soil and stone from the site of the dam base and replacing it with impervious clay fill from distances up to 1,000 feet from a nearby hill.

BUILDING UP THE DAM BASE moves along on schedule as one of three TD-18A scraper combinations brings a heaping load of clay to the construction site.



Moves 1,000,000 cubic yards to build a lake

Howard Prince, veteran Indiana contractor, has used INTERNATIONAL crawlers to build more than 100 lakes since 1935—and he has two large lakes under construction right now!

A water shortage is being remedied and a new vacation area opened by a chain of fourteen lakes being built across Brown County, Indiana, by veteran lake builder Howard Prince, head of the Prince Lake Building Company, Nineveh, Indiana.

Latest and largest in the chain is Cordry Lake, the 103rd lake to be built by Prince.

Cordry Lake, which will eventually cover more than 600 acres, is being created by building a dam 750 feet long, 120 feet high, across two small streams. In excavating unsuitable material from the dam site and borrowing leakage-proof clay from a nearby hill, the lake builders will move over 1,000,000 cubic yards of dirt.

The entire job is being handled by Prince's fleet of seven INTERNATIONAL crawlers with matched IH scrapers and blades, and some other equipment.

Howard Prince has been an INTERNATIONAL owner ever since he first started in business, and states: *"I bought my first* INTERNATIONAL *crawler in 1935 and I've been using them ever since.*

"I've been increasing my INTERNATIONAL *equipment until I now have three TD-18As with scrapers, two TD-14As with blades, a TD-9 and two TD-6s on this job.*

"On lake building projects, as well as all other types of work, they have proved both dependable and economical through the years."

Get the same information that has enabled this successful contractor to make such wise equipment buys for 20 years. Call your INTERNATIONAL Industrial Power Distributor today. From the world's most modern line of earthmoving equipment he'll select the machine "right" for your job and demonstrate it on your job any time you say.

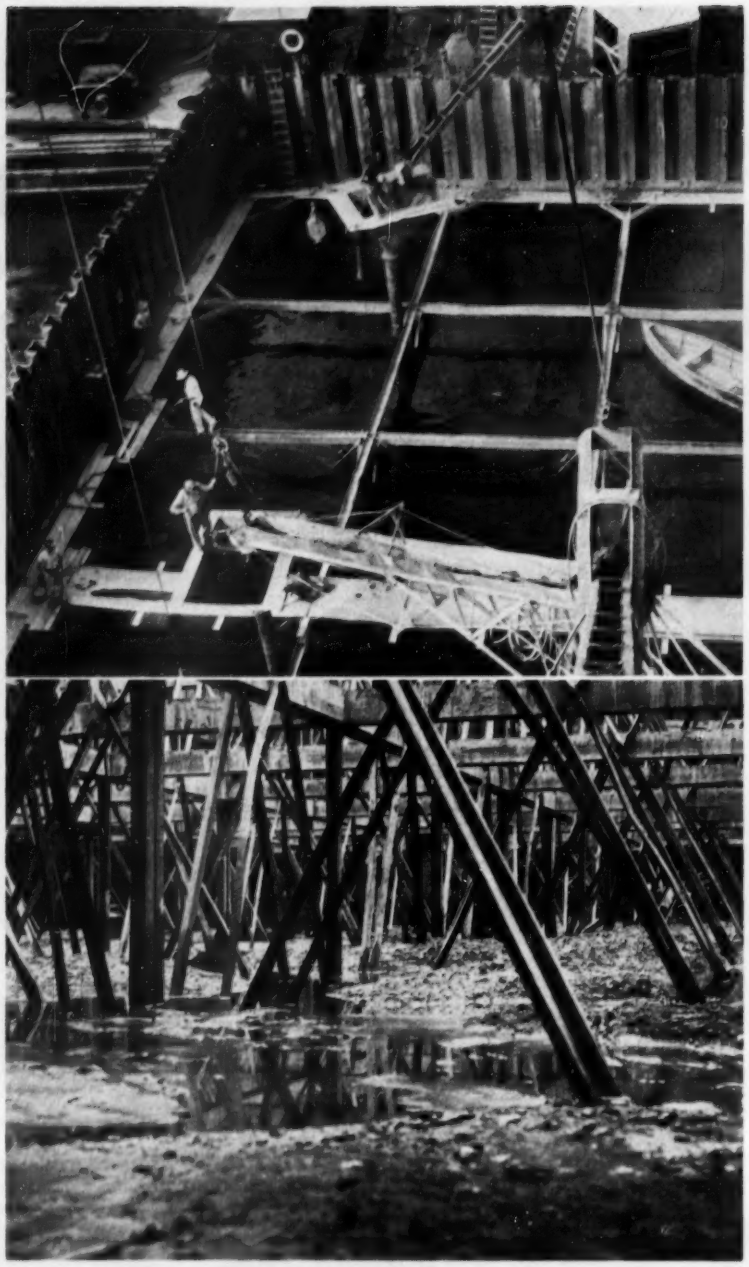
INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.

INTERNATIONAL HARVESTER

INTERNATIONAL
INDUSTRIAL POWER

MAKES EVERY LOAD A PAYLOAD

REMEDY FOR NATURE'S OVERSIGHT. The Brown County Lake Development project is adding immeasurably to the natural beauty of that Hoosier county by building 14 lakes in an area that has all the scenic wonders except lakes.



LARGEST CONTINUOUS UNDERWATER POUR is made with only two tremies (top), which were handled by cranes. Two floating mixing plants chuted 26,670 yd of concrete to hoppers in 172 hr to make 32-ft deep seal pour in 100x220-ft cofferdam for bridge anchorage. After unwatering, surface of concrete (bottom) shows little unevenness or laitance.

composed of sand, cement, fly ash, water and certain additives. While grout is being injected, the placement pipes are slowly withdrawn.

This method is very satisfactory where extreme depths are encountered and where it would be impracticable to use long tremie pipe. Typical uses are the filling of 30-in. pipe piles 300 ft long for the New York Thruway's Tappan Zee Bridge, and major foundations for Mackinac Straits Bridge, placed by Prepakt Concrete Co.

In placing grouted-aggregate concrete, certain precautions are necessary due to the extreme bursting pressures against the form by the still-fluid grout and the ungrouted aggregate above it. In the tremie method, where there is no superimposed load on the rising concrete, pressures are no greater than in any normal pour.

STOODY 21 EXTENDS SERVICE LIFE OF DREDGE PARTS FROM TWO MONTHS TO FULL YEAR

Dredges operated by the W. T. Burton Company, Inc., at Carlys, Louisiana, are used to recover shells from shallow under-water beds; this is the material from which the famous Louisiana shell roads are made. Thousands of tons of highly abrasive sand and silt are handled in the process.

Normally the cutter heads and impellers in such operations last about 60 days; hard-faced with Stoody 21, service life has been increased to a full year. As the hard metal is gradually worn away, the parts are again hard-faced and go back into service. Huge savings result in increased parts life and reduced down-time.

Most heavy equipment subjected to severe abrasive wear and impact can be given similar extended service life with Stoody 21. This material is a high alloy electrode, applied either AC or DC, and its rapid burn-off rate makes it ideal for protecting large surfaces.

Detailed application and procedure information is covered in the Stoody Guidebook that you can get from your Stoody Dealer (consult the Yellow Pages of your telephone book). Your dealer has a free copy waiting for you ... or write to the company.

Entire inner surfaces of cutter head are hard-faced ... approximately 250 pounds of Stoody 21 were required for the cutter head and impeller pictured here. Amount of material will depend on extent of wear. Outer surfaces of cutter blades are hard-faced along cutting edges only.

The entire impeller hub and the leading pressure faces of the vanes are hard-faced with Stoody 21; hard-facing is repeated until side discs are worn out, and hub is then welded into a new unit.

STOODY COMPANY
11972 East Slauson Avenue
Whittier, California

CONSTRUCTION GIANT . . .
Continued from page 61

no corresponding aid for American firms. However, M-K believes that foreign clients are becoming more conscious of the cost savings made possible by the ability of American firms like M-K to give quality construction within or ahead of schedule.

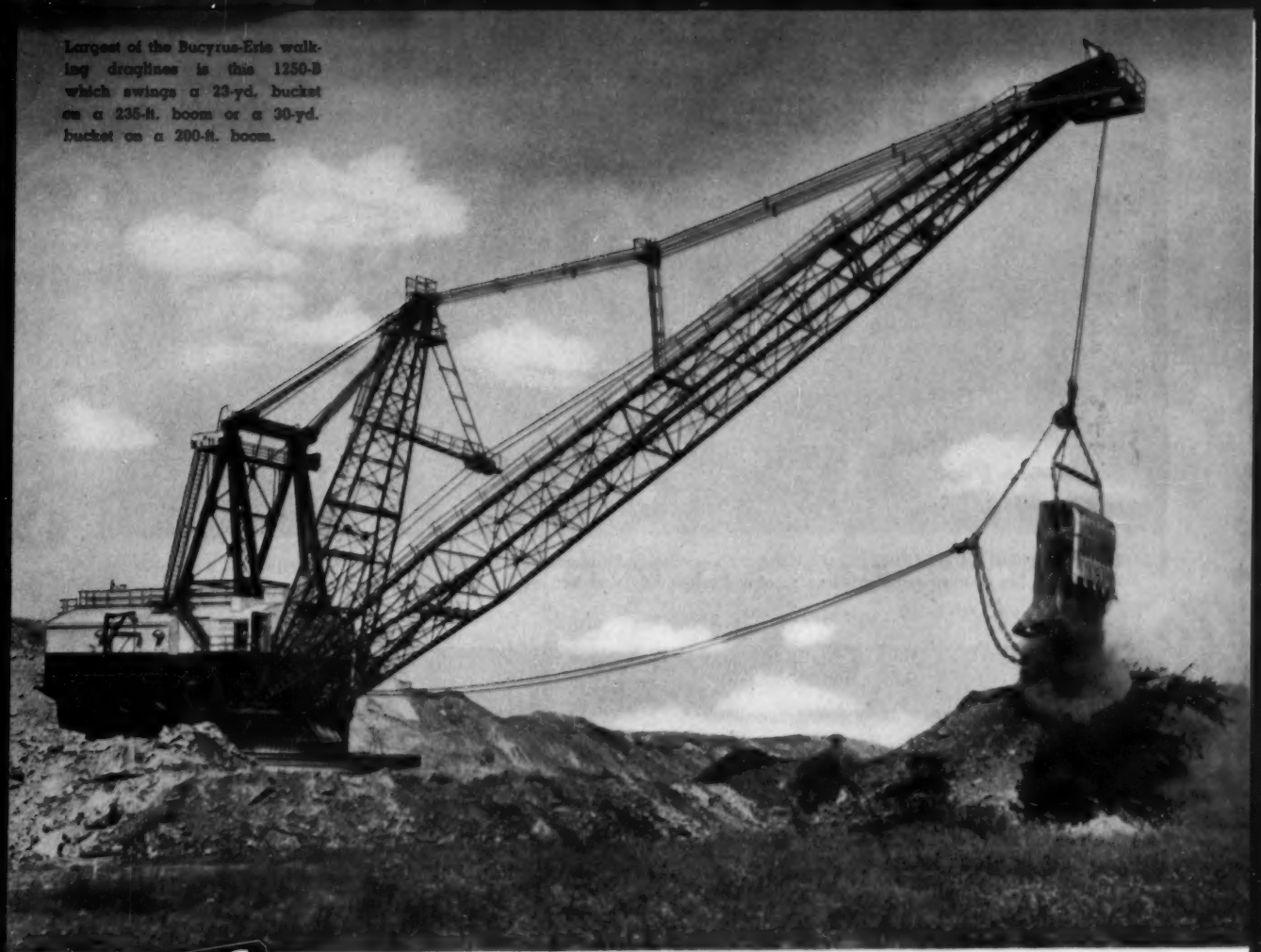
Profits Show the Risk

Gross profits on M-K's domestic business indicate the risky nature of heavy construction (see chart). However, since 1921 the firm lost money in only two years—1932 and 1937, both of which were bad years for most business.

Profit margins have been noticeably lower in the four years 1950-1954, compared with the earlier post World War II years. But while its total domestic business dropped sharply in '53 and '54, M-K increased its margin of profit in each of these highly competitive years. The firm was able to do this in 1954 because of "the ample and ready supply of construction materials at all times and the marked decline in work stoppages due to labor disputes."

Equipment Vital

M-K believes in keeping its construction equipment fleets consistently up to date with the most modern and efficient types available. The parent company at the end of '54 had 3,794 equipment units representing an initial investment of almost $25 million. Purchases of new construction plant and equipment totaled nearly $3.3 million last year, bringing the total bought in the last five years to $25.4 million.



Largest of the Bucyrus-Erie walking draglines is this 1250-B which swings a 23-yd. bucket on a 235-ft. boom or a 30-yd. bucket on a 200-ft. boom.

BUCYRUS ERIE ... *Maker of the World's Largest Selection of*

WALKING DRAGLINES

For efficient, large-scale excavation, you will find a Bucyrus-Erie walking dragline to match your job. There are ten models, from the readily dismantled and reassembled 180-W to the big 1250-B — the largest selection of walking draglines in the world.

Whatever size you choose, you are assured of the same dependable performance that has been characteristic of Bucyrus-Erie walking draglines for years. They have front end design that combines great strength with light weight; the exclusive Bucyrus-Erie walking action with simplicity of design, cushioned action and smooth, fast moveups; and Ward Leonard variable voltage control on all electric powered machines — plus many other features which have made them famous the world over.

Whenever a job involves huge yardages, a Bucyrus-Erie walking dragline — in a size to fit your needs — is a dependable way to economical output.

47L55C

BUCYRUS-ERIE COMPANY

South Milwaukee, Wisconsin

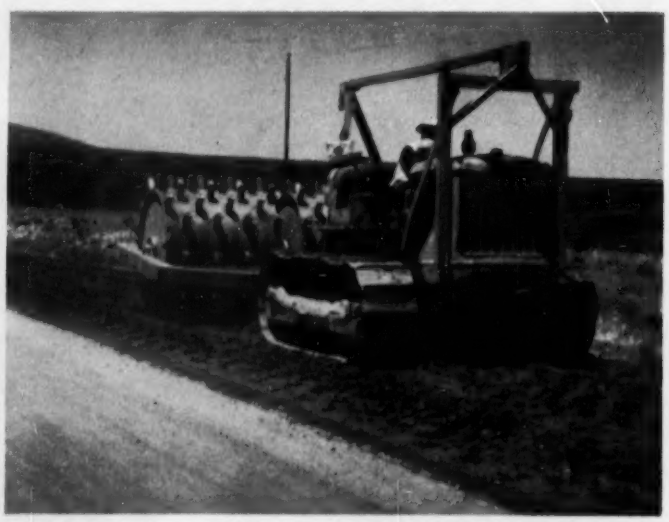
1880 **75 Years of Service to Men Who Shape the Earth** 1955

1 OLD BITUMINOUS SURFACE IS SCARIFIED by Caterpillar motor grader. The scarified material is then pulverized to original aggregate size by a Cat D8-drawn Hyster grid roller. On 4 mi of bad road, 6 in. of gravel was added.

4 TWO SELF-PROPELLED SEAMAN PULVI-MIXERS then mix the soil and cement together. Two passes were required for thorough blending of the soil-cement mixture. Traffic was maintained on one-half the road during construction.

Soil-Cement Stabilizes Road Base at Low-Cost

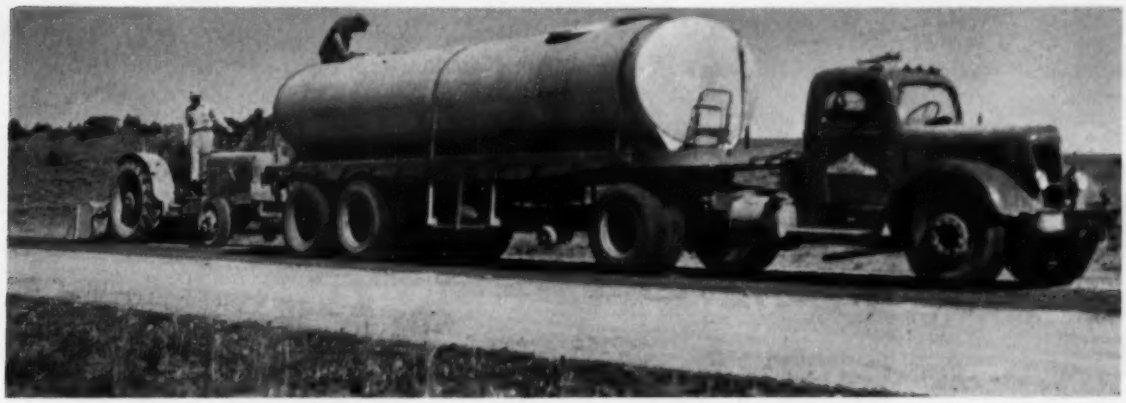
THORN CONSTRUCTION CO. recently completed 294,000 sq yd of asphalt resurfacing on 17 mi of Route US 160 in southeastern Utah. The average cost of the work was $1.73 to $2.02 per sq yd, including soil-cement stabilized base. Gravel and other roadbuilding materials in the area are generally soft and subject to rapid deterioration. However, soil-cement treatment proved adequate base reinforcement. Here's how the Provo, Utah, construction outfit did the job.



6 BOTTOM 4 TO 5 IN. IS COMPACTED, after mixing, by a Cat-drawn sheepsfoot roller. Water is added when necessary to make up evaporation losses and the top inch or two is mulched by the mixers.

2 CEMENT IS SPREAD ON THE ROADWAY at the rate of 6½% by a Smith bulk cement spreader from covered trucks.

3 ROAD IS THEN RESCARIFIED by a motor grader to loosen the soil compacted by the passage of equipment.



5 WATER IS ADDED TO THE MIXTURE through spray bars in one of the Pulvi-Mixers. Two passes are made to add the necessary water, then the material is criss-crossed by the two mixers to even out wet and dry streaks.

7 12-TON GALION TANDEM ROLLER is used for final surface rolling. Production averaged a mile a day half width—better than 8,000 sq yd per day.

8 SURFACE IS SEALED with a 0.2 gal per sq yd application of RS-1 emulsion. After seven-days curing, a 3-in. plant-mix bituminous surface was placed on the soil-cement base.

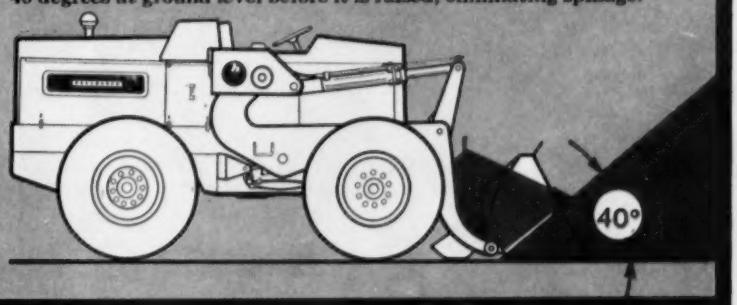
only these **2** completely different

PAYLOADER® TRACTOR-SHOVELS

offer you all these features...

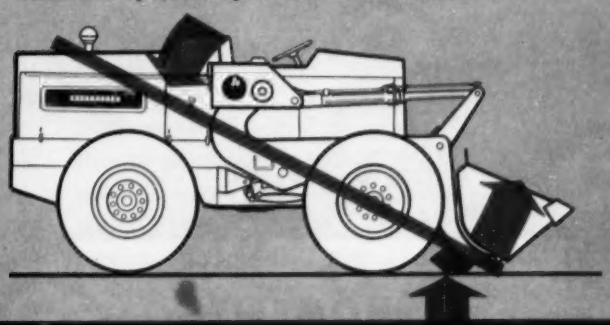
40 DEGREES BREAKOUT AT GROUND LEVEL

You can get HEAPED BUCKET LOADS and you get them FASTER and EASIER WITH THIS NEW BUCKET ACTION. Most important of all—you KEEP BIGGER PAYLOADS—because the bucket can be tipped back a full 40 degrees at ground level before it is raised, eliminating spillage.



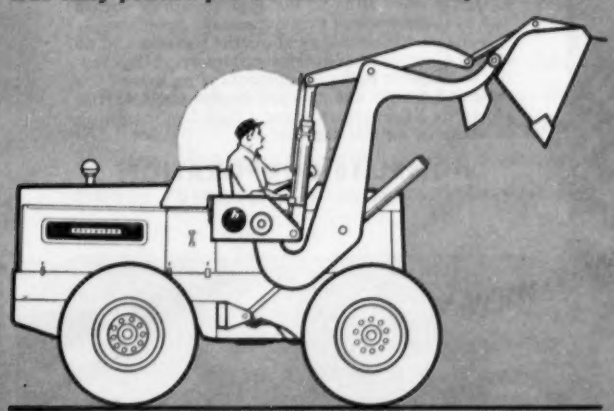
POWERFUL PRY-OUT ACTION

Tremendous pry-out force is obtained by using the breakout pads on the ground as a fulcrum for leverage. The load forces opposing the pry-out action are thus transferred to the ground through the pads instead of to the axle, wheels and hydraulic system of the machine.



SAFETY AND STABILITY

Underslung boom-arm design keeps moving members out of operator's reach at all positions—without using safety guards and screens. Longer wheel base and close, low, load-carry position provide maximum stability and balance.



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HOUGH-QUALITY
HOUGH-PERFORMANCE

more horsepower

per bucket capacity than any other wheel tractor-shovel. Either gasoline or diesel power available.

easy to operate

Fullest operator visibility for safe, fast maneuvering; power-steering; minimum number of control levers. Foam-rubber molded seat and back cushions. Seat adjustable for operator comfort. Longer wheelbase and better balance add to riding comfort.

accessibility

Unusual accessibility for servicing and maintenance. Battery and oil reservoir are located under an easy-access cover just behind driver's seat. Sealed grease fittings. Exterior hydraulic line outlet provided for easy addition of hydraulically-operated accessories.

torque-converter drive

in conjunction with 4-speed, full-reversing transmission provides precise, easy control and the widest possible range of speeds for both forward and reverse. Acts as a shock-absorber for the entire power train.

other features

Closed, pressurized hydraulic system to keep dirt and air out of oil; powerful hydraulic brakes; double-acting hydraulic cylinders and chrome-plated piston rods; 12-volt electric systems on gas-powered models; forward and backup driving lights; tail lights.

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☐ Model HU–1 cu. yd. ☐ Model HH–1½ cu. yd.

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SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

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1006 Riverdale Avenue, Port Chester, N. Y.

TO AMERICAN BUSINESS...

Thanks for Taming a Wild Horse

This is a message of appreciation to American industry. The occasion for the message is the completion of our eighth annual McGraw-Hill Survey of Business' Plans for New Plants and Equipment.

To a considerable degree, our appreciation is personal. It goes to the companies whose cooperation made our survey possible. Twice as many companies as in any previous McGraw-Hill annual survey carefully answered our questions about their plans to invest in new producing facilities. They gave a great deal of expensive time to the job. The cooperation of these companies, which employ nearly eight million workers, put the results of our survey on the firmest footing, in terms of coverage, it has ever had. For this cooperation we are most grateful.

But our appreciation is much more than personal. It extends in even greater degree to the kind of planning of investment in new plants and equipment which our survey revealed. The nature of this planning holds out promise that American industry is on the way toward bringing under control what historically has been one of the most upsetting forces in the American economy—the violent fluctuations in business capital investment. Progress in ironing out these fluctuations gives occasion for public gratitude.

A full report of the results of the eighth annual McGraw-Hill Survey of Business' Plans for New Plants and Equipment will be sent to anyone requesting it from the Department of Economics, McGraw-Hill Publishing Company, Inc., 330 West 42nd Street, New York 36, N. Y.

Very Good Business News

The part of our surveys that attracts the widest interest is the news they give about immediate business prospects. And this year the news is very good. The survey results indicate that American business as a whole plans to invest $29.5 billion in new plants and equipment this year. That is 5% more than was invested last year, and a new high for any year.

Plans for the years 1956-1958 are also remarkably encouraging in terms of the amount of investment in prospect. American business reports that it is already planning to spend within 3% as much for new plants and equipment in 1956 as in 1955. In the past, the expenditures planned for future years have always been sharply lower than those planned for the current year. This is understandable enough. It is sometimes impossible to anticipate all the expenditures that will be necessary a year or more hence. Thus the fact that plans are already made

to spend almost as much in 1956 as this year is very good news about business prospects. The level of investment now planned for the years 1957 and 1958 is also remarkably high—far higher than ever reported for years that far ahead in previous McGraw-Hill surveys.

Taking the Long View

The fact that these plans exist is of immense constructive significance. It clearly indicates that more and more, and now in dramatic degree, American business is taking the long view in making its plans for capital investment. It is developing a program which, if successfully carried out, will go far toward eliminating the habitual, destructive surging and sagging of what is in effect the central power house of our economic system—capital investment by business. Upon the level of this investment depends not only the general state of our prosperity but our progress in raising the American standard of living with new products and new and better industrial processes.

Seven years ago, when we first asked industry to estimate its capital spending beyond the current year, only a small minority of companies could give us any estimates at all. This year, 87% of the cooperating companies—and it was a far larger number of companies—could comply with our request for estimates for the years 1956-1958.

It Pays to Bet on Growth

A number of developments help explain the increase in long-range planning of capital investment. One is the increasing technical complexity of American industry. It often takes longer, in this complicated age, to work out a successful installation of new plants and equipment. Another reason for long-range planning is American business management's increasing conviction that it pays to bet on the demonstrated capacity of the American economy to grow over the long pull. With this goes a corresponding determination not to let short-term business fluctuations upset individual company plans for growth through addition of new plants and equipment. An additional factor, and one of great and increasing importance, is the sense of public responsibility on the part of American business leaders who want to help prevent destructive swings in the levels of new investment.

It cannot be too strongly emphasized that there is still nothing automatic about the carrying out of these long-range plans for business spending. Actual expenditures are still governed in major degree by the general health of our economy. This is fully attested by the fact that the current business recovery has led to a substantial upward revision of the investment plans reported to us last fall when we made a preliminary check of plans for 1955. Either private economic excesses or a reversal of the recent improvements in federal tax policy could gravely upset realization of present plans. Fortunately, neither of these possibilities seems to be an immediate threat.

The very fact, however, that American business management has made these plans and will do its utmost to carry them out is a development of tremendous constructive importance for the American economy. It means that major efforts are being made to tame what historically has been an economic wild horse—the process of capital investment by business. Both for doing it, and for telling us about it in our annual surveys, we extend to American industry our sincere thanks.

This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nationwide developments that are of particular concern to the business and professional community served by our industrial and technical publications.

Permission is freely extended to newspapers, groups or individuals to quote or reprint all or parts of the text.

Donald C. McGraw

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"You'll be happy to know that we consider this the best vibrator we've ever owned. It's got lots of extra power and sure is built to stand up."

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MODEL GW → with wheelbarrow base. For heavy duty work. Reliable 6 HP Wisconsin engine. 9,000 VPM.

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"Torture-Testing" Builds Axles that can take it. In our indoor proving ground, we have concentrated every hazard of a million miles of driving. TDA axles prove themselves against tests like this one . . . where an axle shaft is twisted 14° backwards and forwards, 36 times a minute, for months on end. Other tests simulate a 3,000 mile uphill haul with a full load. Only tests this rugged could produce axles this serviceable.

HEAVY LOADS ARE PAYLOADS

...and exclusive Timken Inter-Axle cab controlled lockout at any speed!

Every heavy trucker has *two* big problems to lick. First, to deliver *more payload* faster. Second, to get the *most service* out of his equipment . . . with less maintenance costs, less downtime.

Timken-Detroit has spent 37 years developing the most helpful answer to heavy hauling! The TDA Tandem Drive Rear Axle Unit! The lightest, strongest, most serviceable unit of its kind ever produced.

Engineering is the keynote of TDA Tandem superiority. Unlike ordinary tandems, in TDA Straight Line Drive, propeller shafts form an absolutely straight line from the forward rear axle back to the rearmost axle. This permits smoother transmission of power, no noisy *around the corner operation*.

Other TDA Tandem design advantages give you longer trouble-free service, quieter, more economical performance, bigger savings on man and equipment time. Maintenance is easier, too. TDA design allows almost complete interchangeability of parts between four and six-wheelers. Solid benefits explain why TDA is the choice of manufacturers and operators everywhere.

How TDA Inter-Axle Differential cuts truck and tire wear! With cab-controlled lockout!

When tandem tires are mismatched...or when tandem trucks are going over rough grades . . . one set of wheels must turn faster than the other or be dragged. TDA Inter-Axle Differential permits either wheel to do this when necessary. Also, with TDA, the driver can, when necessary, lock out the differential and obtain a straight-through drive in mud or sand.

THREE TYPES: Hypoid-helical double-reduction, optional inter-axle differential. Worm drive, without inter-axle differential.

For six-wheeler operation . . .

THE TDA TANDEM DRIVE REAR AXLE UNIT

Now—the *world's finest* tandem drive rear unit for heavy-duty motor trucks!

And with these features, developed, introduced and pioneered by TDA: (1) Available in 3 types of final drives and 3 capacities. (2) Top-mounted straight-line final drive eliminates propeller shaft angularity. (3) Optional inter-axle differential . . . spur gear design, cab-controlled power-lockout. (4) Torsion flow axle shafts . . . guaranteed for 100,000 miles or three years, whichever occurs first. (5) Hot forged steel axle housing . . . guaranteed for the life of the vehicle. (6) Unit-mounted "P" series power brakes . . . for longer life, greater economy and efficiency. (7) Cradle ride spring suspension and paralleled torque rod system . . . maintain correct alignment and weight distribution regardless of driving and braking conditions. (8) Exclusive two-piece trunnion tube bracket speed servicing. (9) Removable torque rod and spring guide brackets . . . for positive alignment, easier replacement. (10) Rubber torque rod bushings and rubber spring seat bushings . . . eliminate metal-to-metal contact. Require no lubrication.

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Differential that permits

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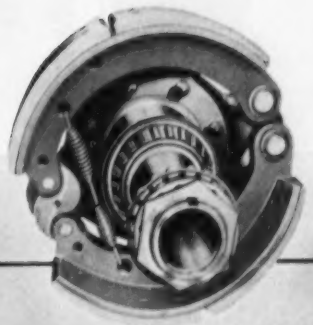

ONLY TDA BRAKES give all these tested advantages!

- Brake shoes made of steel save up to 40 pounds per axle . . . give strong braking action with no distortion.
- Patented liner shape—thickest where wear is greatest.
- Liners riveted on—no chance of movement on shoe.
- Liners circle-ground to cover all efficient braking area of shoe.
- Rustproofed anchor pins locked in. Ends of pin sealed against foreign matter.
- First with self-aligning camshaft housings.
- Cam rollers heat-treated to roll smoother, wear longer.
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- Compare similar products part for part and prove to yourself that TDA brakes incorporate the finest quality materials, skilled workmanship and advanced design.

Pads Give Pry-Out Action...

...For Full Bucket Loads

A CM&E

Equipment Report

COMPLETE BUCKET BREAKOUT at ground level (up to 40 deg of rollback) is an extra-profit feature built into two entirely new Payloaders just put on the market by the Frank G. Hough Co., Libertyville, Ill.

And this breakout is amazingly complete and effective when used under rough conditions. CM&E editors watched the new 1½-yd (heaped) Model HH four-wheel-drive Payloader roll up to a low hill of hard-packed clay. The bucket was pushed into that tough, sticky bank and then "rolled out" neatly with hydraulic power. It came up quickly with a heaping load of gumbo of a type that is hard to handle with any earthmover or excavator.

Maximum bucket loads are brought out with a minimum of power, even under tough conditions, through the ingenious application of an age-old principle—"pry-out action."

Two broad steel pads on the bottom of the sturdy bucket-supporting arms rest directly on the ground and the bucket is tipped forward and backward hydraulically, the breakout pads on the ground becoming a fulcrum for powerful leverage.

The opposing forces brought into play when cutting out a load of material are transferred directly into the ground, instead of to the axles, wheels and hydraulic system of the Payloader.

Fast Dumping Too

The heavy, sticky clay presented another challenge to the operator of the new 1½-yd (heaped) Model HH. How do you get the gummy stuff to drop out, leaving a clean bucket with no large gobs left sticking in the corners? That's easy. The operator simply raps the bucket smartly against steel stops when dumping, to jar loose any sticking lumps. Special steel stops prevent damage that otherwise might be brought to hydraulic cylinder and piston rod ends.

Frank G. Hough, first of the tractor shovel pioneers to apply hydraulic power to bucket operation, still is head man of the company he founded. Through the years he has inspired the improvement of pumps, valves, cylinders and hose lines—to improve performance and increase capacities.

(Continued on page 129)

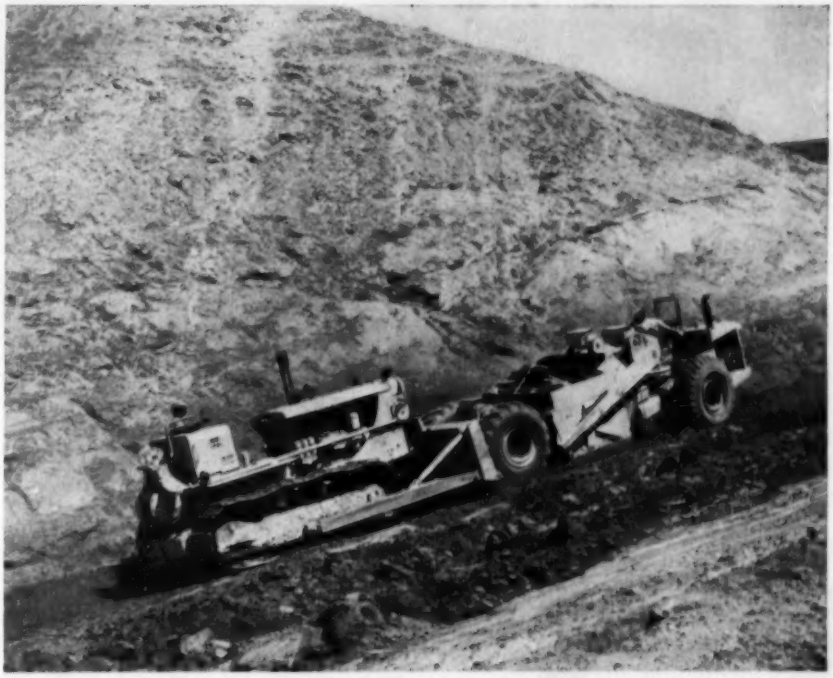
The Engineer's Report

CASE HISTORY
PRODUCT *RPM Tractor Roller Lubricant*
FIRM *J. Tomei and Sons, Van Nuys, Calif.*

Track bearings good after 10,550 hours' tough work!

WORKING IN GRITTY DIRT with much side-hill operation, a dozer like this went 10,550 hours on a single set of track rollers, lubricated exclusively with RPM Tractor Roller Lubricant. The rollers were then replaced, but only because flanges were worn off. The bearings themselves were still in good condition, even after such extended service.

J. Tomei and Sons, Van Nuys, California, have used only RPM Tractor Roller Lubricant in track bearings since 1937. They report it gives them service like this in all their equipment even though most work is building roads through the highly abrasive decomposed granite of Southern California. They find it helps seal grit out of the bearings, tends to float away any dirt that does get into them, and won't squeeze off under extreme loads.



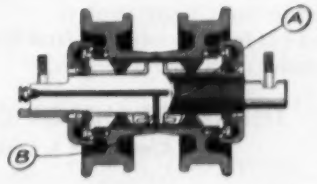
REMARKS: Three grades of RPM Tractor Roller Lubricant meet all climatic and operating conditions in Caterpillar-type track roller bearings. For Allis-Chalmers bearings, RPM Tractor Roller Lubricant A/C Type is recommended.

FOR MORE INFORMATION about petroleum products of any kind or the name of your distributor, write or call any of the companies listed below.

RPM

TRADEMARK "RPM" REG. U.S. PAT. OFF.

How RPM Tractor Roller Lubricant resists wear in the toughest service

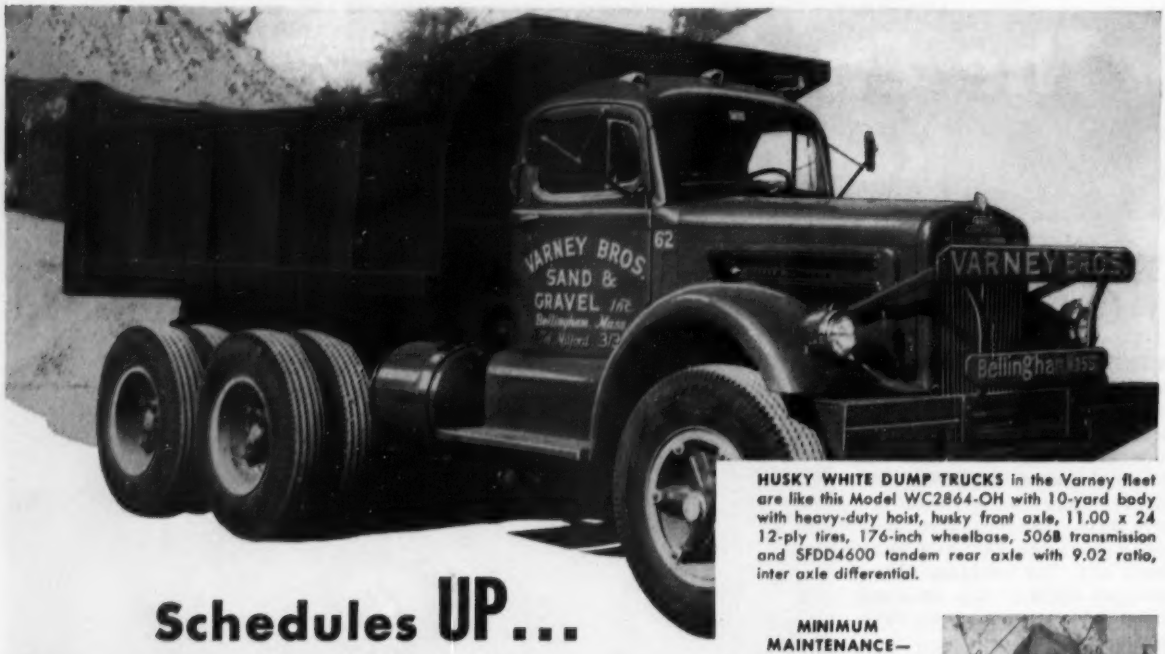


It flows evenly to all bearing surfaces, lubricates and retards rust formation.

A. Contains chemical anti-wear agent—maintains tough lubricating film.

B. Has stringiness compound—improved viscosity, resists leakage, helps keep protective grease seal outside bearings.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20 • STANDARD OIL COMPANY OF TEXAS, El Paso
THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey • THE CALIFORNIA COMPANY, Denver 1, Colorado



HUSKY WHITE DUMP TRUCKS in the Varney fleet are like this Model WC2864-OH with 10-yard body with heavy-duty hoist, husky front axle, 11.00 x 24 12-ply tires, 176-inch wheelbase, 506B transmission and SFDD4600 tandem rear axle with 9.02 ratio, inter axle differential.

Schedules UP... Operating Costs DOWN with WHITE SIX WHEELERS

VARNEY BROS., Inc.
Bellingham, Mass.
boosts loads
with WHITES

WHETHER it's sand and gravel or ready-mix, Varney Bros. Sand & Gravel Co. have stepped up schedules with White Six-Wheelers. Operating costs are down, too!

It's the same story across the country. The big loads, the tough trips, the tight schedules go by White . . . and leaders everywhere report that Whites cut operating costs, boost profits.

Find out for yourself! Get facts from your White Representative . . . today!

THE WHITE MOTOR COMPANY
Cleveland 1, Ohio

MINIMUM MAINTENANCE—
White Mustang Engines have plenty of power for outstanding performance, Donald A. Varney, president, reports.

"Whites assure us economical operation of our truck fleet," he says.

BIGGER LOADS—
Treasurer Clarence E. Varney says this fleet of 19 Whites cuts costs . . . boosts deliveries. Bigger payloads important for more savings.

TWO MORE WHITES
—Two more White Six-Wheelers have just been added to the Varney fleet to keep up with demands for concrete for construction according to Richard Varney, vice-president.

FLEET OF WHITES keeps rolling! Here is part of the Varney ready-mix fleet which operates in the heart of Massachusetts. Varney has boosted body capacities substantially and the Whites are rugged and ready to go with these bigger payloads.

White

FOR MORE THAN 50 YEARS THE GREATEST NAME IN TRUCKS

COMPANION MODEL to new HH Payloader (pictures previous page) is new HU machine that holds 1 yd heaped. Rigs' underslung booms give extra visibility and safety.

Hough Payloaders long since have made their mark around the world wherever loose materials are handled—whether in large or small volume.

But pioneering and the quest for improved performance and capacities goes on. Some of the basic engineering changes in the new Model HH and its companion 1-yd (heaped) Model HU have been under test for five years. Tests are conducted with machines under all conceivable conditions, handling all kinds of materials, day and night for thousands of hours and in all kinds of weather. It's a long grind for any new idea or metal, but Hough insists on tested quality.

Low breakout at ground level makes it possible to get heaped buckets quickly and carry them lower for greater stability and less spillage. Loads are carried close to the machine and it is claimed that the two new models are more stable loaded than empty. Whether raising or lowering, the bucket remains at the same angle of tilt selected by the operator.

Safety for the operator is another dividend. Underslung boom arms provide unusual driver visibility and safety. Because boom arms and hydraulic cylinders and rods never rise up to the operator's level, there is no need for safety guards or vision-limiting screens.

Operator comfort has received much consideration. An operator on a machine that handles easily and rides well will get more work done with less effort. On the HH and HU, adjustable seats with foam-rubber cushions and backs are standard equipment. Longer wheelbases also add to comfort, as well as machine stability.

Hough engineers claim increased horsepower and weight in relation to bucket capacity. That combination should spell out more work done daily with less wear throughout.

Both models are available with either gasoline or diesel power, have torque-converter drives, full-reversing transmissions, hydraulic brakes and power steering. Close-tolerance machining for interchangeability of parts is a point of particular pride in the Hough plant.

Convenience for routine servicing and maintenance is accomplished by grouping service items at common points. For example, the electric storage battery and hydraulic oil reservoir are placed behind the operator's seat, reached by lifting a single cover.

The hydraulic system is a sealed, pressurized unit. Hydraulic cylinders have double-acting pistons with chrome-plated rods to resist wear. Cylinders are so located that materials and rock spilling out of the bucket cannot harm them. Each Payloader also is equipped with exterior hydraulic pick-off outlets to serve auxiliary equipment.

An accumulator in the hydraulic system is optional, offered for use where the owner wants to provide added protection to operator and machine by dampening out most of the load shocks.

Driving lights front and rear are standard equipment.

* * *

SPECIFICATIONS
Model HH Payloader

BUCKET:

Heaped capacity	1½ cu yd
Struck capacity	1⅛ cu yd
Width	6 ft 6 in.
Breakout force	10,000 lb
Carry load—max (4 mph)	5,500 lb
Lifting load—max (0 mph)	11,000 lb
Maximum dumping height	9 ft
Angle of breakout, ground level	40 deg
Maximum tipback	50 deg
Angle of dump	50 deg

OVER-ALL MEASUREMENTS:

Height	6 ft 8¼ in.
Width	7 ft 5¾ in.
Length (bucket on ground)	16 ft 11½ in
Wheel base	7 ft ¾ in.
Tread (front and rear)	5 ft 3¼ in.
Turning radius	20 ft 1½ in.
Tires	12:00x24, 8 - ply

HYDRAULIC SYSTEM:

Boom rams: Two double-acting 4.5-in. dia piston rods
Bucket rams: Two double-acting 4.5-dia piston rods

ENGINE:	*Gas*	*Diesel*
Make	Hercules	Hercules
Model	JXD	DJXH
Max hp, governed speed	100	92
Governed rpm	2,200	2,200
Max torque (ft lb)	251	234
(rpm)	1,400	1,400
Bore and stroke	4x4¼	3⅝x4½
Number cylinders	6	6
Displacement (cu in.)	320	293

TORQUE CONVERTER: Single-stage two-phase; stall ratio, 2.07

CLUTCH: 14-in. dry disk

BRAKES: 4-wheel, hydraulic/hydrovac booster

TRANSMISSION:

Forward	1	0 — 2.6 mph
	2	0 — 4.9 mph
	3	0 — 10.4 mph
	4	0 — 20.0 mph
Reverse	1	0 — 4.0 mph
	2	0 — 7.7 mph
	3	0 — 16.1 mph
	4	0 — 31.1 mph

WEIGHT:

Total	15,800 diesel 15,400 gas

(Continued on page 132)

The Wonder Grease for Concrete Forms

REGARDLESS of whether you use steel or wooden forms for concrete work — you can apply Globe Form Grease by spray, brush, or swab. This time-tested paste emulsion will reduce peeling and pitting to a minimum when forms are removed, and practically eliminate patching.

Due to its special adhering qualities, Globe Form Grease requires only a thin coating for utmost effectiveness. In fact, one gallon adequately covers approximately 200 square feet! And in addition — Globe Form is stainless, leaves a whiter smoother surface, and eliminates the need for painting.

Why not write for full particulars today? Once you use Globe Form Grease, you'll understand why engineers and contractors hail it as the "wonder grease" for concrete forms.

OILS *and* GREASES
for every purpose
DIESEL
STEAM
AUTOMOTIVE

Write for descriptive booklet of all Borne, Scrymser products.

BORNE SCRYMSER Since 1874

Our Laboratory Facilities are always at your disposal

BORNE, SCRYMSER COMPANY ELIZABETH, N. J. • CHARLOTTE, N. C.

Make All Your Low Pressure Hose Lines from This *NEW* Aeroquip Kit

SPEED REPLACEMENT! CUT COSTS! REDUCE INVENTORY!

DURABLE ALL-STEEL BOX

JUST PUSH Aeroquip 1525 Hose on the **SOCKETLESS** Fitting . . . It Stays On Even at Pressures as High as 250 p.s.i.

PATENT APPLIED FOR

Back of fitting tray can be raised for convenient use

Kit 5144 contains 93 fittings and adapters in 20 sizes and types

Compartment of Kit 5144 contains 24 ft. of ¼" hose, and 24 ft. of ⅜" hose

Pull out hose, measure it, and cut with knife

Many users have requested a permanent-type container for Aeroquip *SOCKETLESS* fittings and hose. So this durable all-steel Kit 5144 is now available. It contains an inventory of hose, fittings, and adapters in types and sizes that will meet practically all low pressure applications.

With remarkable new Aeroquip *SOCKETLESS* fittings and hose, fuel, oil, water, and air lines can be made and installed *extra fast* on all kinds of industrial and mobile equipment. Field replacement is simplified because Kit 5144 is compact (12½" x 12½" x 6½" when closed) and it will stand up in field service.

Aeroquip *SOCKETLESS* fittings and hose are saving time and money for users in every industry. Get the complete story from your Aeroquip distributor, listed in your Yellow Page Directory, or write us.

Also Available: 15-Cell Kit No. 5143 with 24 feet of ¼" hose and 71 fittings and adapters in same box.

Aeroquip

REG. TRADEMARK

AEROQUIP CORPORATION, JACKSON, MICHIGAN

LOCAL REPRESENTATIVES IN PRINCIPAL CITIES IN U.S.A. AND ABROAD • AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

NEW FRONT-END LOADER

Continued from page 129

SPECIFICATIONS
Model HU Payloader

BUCKET:

Heaped capacity	1 cu yd
Struck capacity	¾ cu yd
Width	6 ft 6 in.
Breakout force	8,000 lb
Carry load—max (4 mph)	4,000 lb
Lifting load—max (0 mph)	8,000 lb
Maximum dumping height	8 ft
Angle of breakout, ground level	40 deg
Maximum tipback	40 deg
Angle of dump	47 deg

OVER-ALL MEASUREMENTS:

Height	6 ft 10¼ in.
Width	7 ft 2 in.
Length (bucket on ground)	16 ft 6⅛ in.
Wheel base	6 ft 10⅝ in.
Tread (front)	5 ft 3⅝ in.
Tread (rear)	5 ft 4⅝ in.
Ground clearance	11¼ in.
Turning radius	21 ft
Tires	12:00x24, 6-ply

HYDRAULIC SYSTEM:
Boom rams: Two double-acting 4.5-in. dia piston rods
Bucket rams: Two double-acting 4-in. dia piston rods

ENGINE:	*Gas*	*Diesel*
Make	Hercules	Hercules
Model	JXC	DIX-6-272
Max hp, governed speed	84	84
Governed rpm	2,200	2,200
Max torque (ft lb)	206	203
(rpm)	1,500	1,500
Bore and stroke	3⅜x4¼	3 11/16x4¼
Number cylinders	6	6
Displacement (cu in.)	282	272

TORQUE CONVERTER: Single stage two phase; stall ratio, 2.12

CLUTCH: 14-in. dry disk

BRAKES: front wheel, hydraulic

TRANSMISSION:

Forward	1	0 — 2.4 mph
	2	0 — 4.7 mph
	3	0 — 9.7 mph
	4	0 — 18.7 mph
Reverse	1	0 — 3.7 mph
	2	0 — 7.3 mph
	3	0 — 15.1 mph
	1	0 — 29.2 mph

WEIGHT:
Total 13,000 gas
13,340 diesel

Productive Maintenance

GOOD CARE of equipment can spell the difference between a profit and loss on many projects. The downtime induced by the failure of one big machine can be quite costly. Accumulated losses with many small tools cost money too. Read about Productive Maintenance in CONSTRUCTION METHODS AND EQUIPMENT in July issue.

No stick in the mud, this tractor!

Oliver OC-18 turns mud to profit: two-track power, wide torque engine pay-off!

Even in deep, sticky clay, this Oliver OC-18, excavating on a superhighway, kept right on working—piling up profits in spite of the gummy ground condition.

Oliver's husky, 133 drawbar h.p. engine has what it takes to pull through tough going. An exceptionally wide torque span actually steps up lugging power as the engine slows under load. In fact, the OC-18 can deliver 34,000 maximum drawbar pounds' pull in first gear at 1½ miles per hour!

Combined with this power is the OC-18's extra-high clearance and exclusive steering that keep power on both tracks at all times. You can work in wet, muddy ground...over rocks and obstructions...turn out more work every day in any weather!

Try the OC-18 yourself. Learn its power and traction advantages as well as its easy maneuverability and effortless, finger-tip air steering. See or call your Oliver Industrial Distributor for a demonstration.

The Oliver OC-18 is available with cable or hydraulically operated bulldozers.

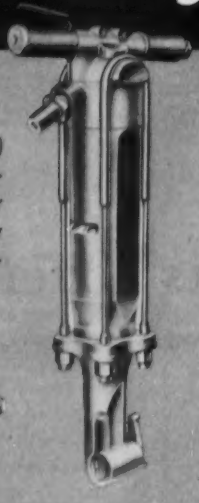
THE OLIVER CORPORATION
400 W. Madison Street, Chicago 6, Illinois

a complete line of industrial wheel and crawler tractors

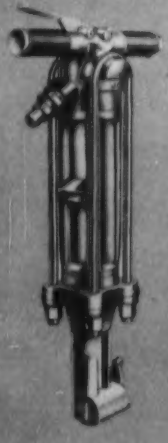
K-89 (90 lbs) Extra heavy blows for breaking tough, dense concrete sections.

Here's what you get in a

JOY PAVING BREAKER



K-81 (80 lbs) Rapid, powerful blows for breaking heavy reinforced concrete paving.



K-61 (65 lbs) Wide range of application for medium demolition and heavy spading.

K-31 (30 lbs) Easily handles demolition of thin concrete sections and light masonry.

LONG WEAR Cadmium plating inside and out prevents rust and corrosion. Cadmium, which develops lubricating qualities under heat and stress, eliminates scoring and facilitates running-in. Long life is further assured by a throttle-controlled lube system. Each movement of the throttle shoots exactly the right amount of oil to all working parts.

ECONOMICAL OPERATION A unique mechanism . . . the Dual Valve . . . gets the *maximum* out of your air supply. By controlling the air on the *up* stroke as well as the down, the Dual Valve actually makes air do more work.

RUGGED, SIMPLE CONSTRUCTION U-type side rods give the balanced tension of *four* rods. This assures perfect alignment of parts, eliminates old-fashioned side rod springs, and stops side rod breakage. The breaker tool is held tightly by a cam-type retainer—a simple flip down to release or up to secure. It has no troublesome nuts, bolts, lock washers, springs, etc.

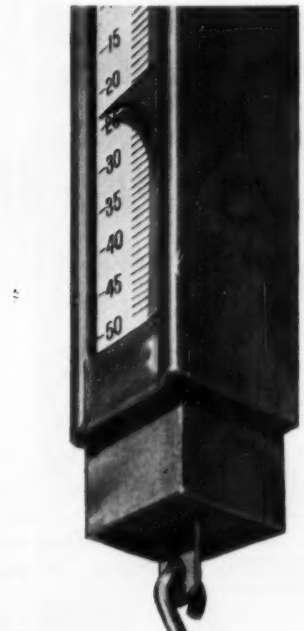
OPERATOR COMFORT The piston of a Joy Breaker never strikes the front head. A cushion of air absorbs the blow after the full force has been delivered to the breaker tool. This reduces shock, vibration and operator fatigue. The streamlined design allows the operator to lift and slide the breaker against his leg without collecting bumps and bruises from projections.

FREE BULLETIN Complete details on Joy Paving Breakers can be had by writing for Bulletin 87-P to ***Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

Consult a Joy Engineer

JOY W&D C-5497

CONSTRUCTION EQUIPMENT MANUFACTURERS FOR OVER HALF A CENTURY



WEIGHS ONLY 24 POUNDS

9 out of 10 scaffolding jobs can be completed with this versatile 5-foot frame alone — no other parts required! 50% lighter than conventional frames and easier to handle, it speeds construction and maintenance jobs, big and small.

Brainard®
SCAFFOLDING SYSTEM

LIGHTWEIGHT PARTS

make one-man assembly EASY... FAST... SAFE

• Brainard Scaffolding cuts costly erection time . . . enables *one* man to handle most jobs with *one* part—a lightweight, tubular steel frame.

One 4-frame section weighs less than 100 pounds—a lightweight pickup truck can carry 100 frames—enough scaffolding to erect a structure 16 feet high and 55 feet long.

Frames simply slip-fit together. No nuts, bolts or tools are required. No danger of loose connections. One man can assemble a section in less than a minute . . . erect a 12 or 14-foot tower in three minutes!

Brainard Scaffolding is load-tested at 300 pounds per square foot of planked area—far in excess of usual code requirements for heavy-duty scaffolding.

For complete information on this new and unique scaffolding, write today to Brainard Steel Division, Dept. *C-6,* Griswold Street, Warren, Ohio.

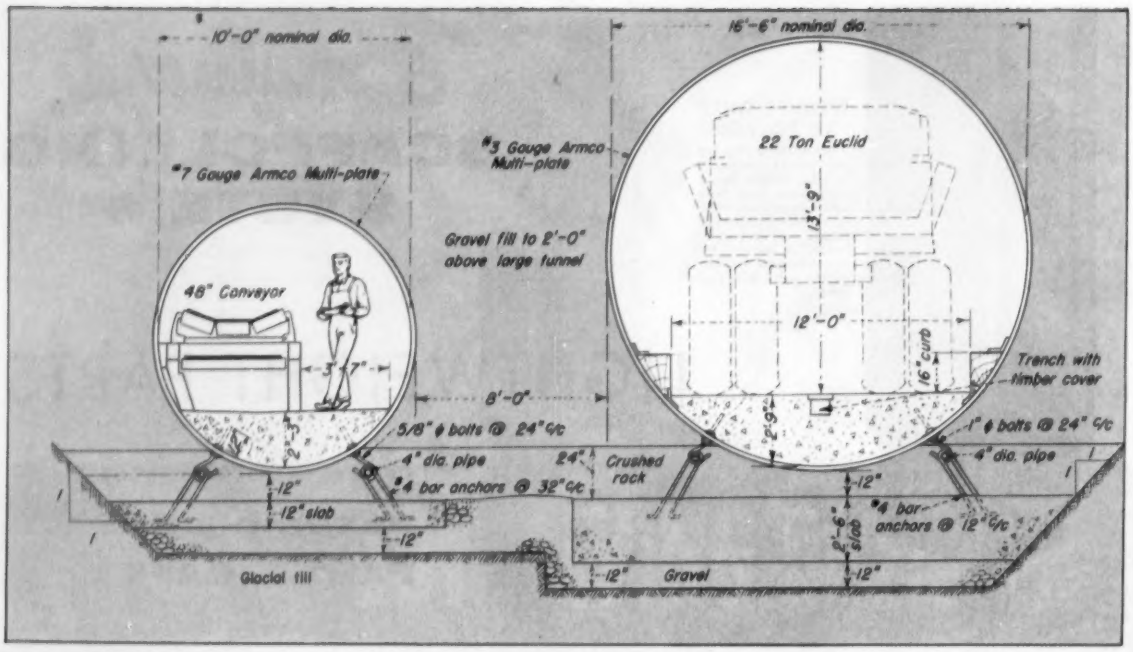
Only **BRAINARD** *offers all these benefits:*

- **Easy to Assemble**
- **Easy to Handle**
- **Easy to Estimate**
- **Saves Time**
- **Reduces Labor**
- **Reduces Inventory**

Brainard®
SHARONSTEEL
STEEL DIVISION
SHARON STEEL CORPORATION

SCAFFOLDING • PALLET RACKS • BUILDING PRODUCTS • COMPLETE STRAPPING SYSTEMS & MATERIALS • WELDED STEEL TUBING • ELECTRO-GALVANIZED STEEL

Offices in principal cities throughout the U. S.



TUNNEL SECTIONS show how materials, men and machines will go under canal to get to and from powerhouse site on St. Lawrence development of Ontario Hydro. Both tubes, each 368-ft portal-to-portal, were built in a common trench behind cofferdams.

Haul-Road Tunnel Ducks Under Canal

BOLTS ARE DAUBED with waterproofing compound after shell section is assembled alongside tunnel trench. Bolts also carry special washers, and joints are welded, for water seal.

THE CORNWALL CANAL cuts off the Hydro-Electric Power Commission of Ontario from easy access to the site of its Barnhart Island powerhouse construction project. To get men and materials readily to and from this vital unit of the St. Lawrence Power-Seaway development, Ontario Hydro had three choices for crossing the heavily traveled ship canal: a high-level bridge, a movable bridge, or a tunnel. The tunnel, or rather two tunnels, were put in as being the most economical temporary solution of the access problem.

The parallel tunnels—a 10-ft tube for pedestrians plus 48-in. conveyor belt, and a 16½-ft tube large enough to accommodate a 22-ton Euclid rear-dump truck—are 368 ft portal-to-portal. They are made, respectively, of No. 7 and No. 3 gage Armco Multi-Plate corrugated metal, and were installed in the dry.

Ontario Hydro's first step in tunnel construction was to divert the canal after traffic on it was shut down for the winter. For this, a sheeted 12x14-ft flume was built around one end of the site. Canal water was trained through the

(Continued on page 140)

Mountain moved to make 5000′ breakwater for west-coast harbor

When bank consists of big, jagged pieces of sandstone like this, competitive rear-dump trucks, assigned 15% of total yardage, stand idle. Some of the rocks handled by the Tournarockers measured 5 x 6 x 12 ft. and weighed over 30 tons.

To better protect the harbor at Ensenada, one of Mexico's few Pacific-coast ports, a fleet of modern earth-movers is rushing completion of a giant breakwater. This structure of blasted rock will extend 5,000 ft. into the sea, average 130 ft. wide (water is over 50 feet deep in many spots).

Owned by Clark and Mansilla Co., Ensenada, 6 rear-dump Tournarockers are handling 85% of the yardage. Several times a day, sandstone rock is blasted from a mountain near the water's edge. This jagged material is shovel-loaded into Tournarockers, hauled to the end of the growing breakwater, and dumped into the sea.

A touch of an electric switch on operator's panel dumps rocky fill into the ocean 10 ft. below the breakwater. Independent brakes, front and rear, allow operator to back safely to the edge, lock rear wheels, roll front wheels back to dump clear.

Drive over rocky fill, dump safely

The haul road is naturally very rough and bumpy because it passes over previous fill that is 80% blasted rock. Giant tires, 4-wheel air brakes, and independent positive power steer make it safe for Tournarockers to travel this long "finger" far out into the ocean. Loaded with 12 yds. of sandstone, Tournarockers with their big rubber tires compact the fill during normal cycles.

The 6 machines work two 8½-hour shifts daily, 6 days per week. Each delivers 60 pay yds. per 50-minute hour, traveling over 5200-ft. cycles. Individual trips average 7.7 minutes (including 2.4 minutes to load).

Clark & Mansilla's Tournatractor handles both clean-up work on the breakwater and haul road maintenance. Four-wheel drive on big low-pressure tires puts plenty of power and traction behind the blade to shove huge rocks like this into the bay.

In spite of delays for blasting, and difficulties in shovel-loading large and awkwardly-shaped rocks, Tournarockers' dependability and speed help keep work on schedule. "Our Tournarockers," say owners Clark and Mansilla, "are doing an excellent job on this breakwater. We are amazed at how well they stand up under the rough conditions."

Pleased with service

Capt. Ignacio de la Vega, in charge of all operations, says that he is pleased with the equipment and with the service and cooperation he gets from his LeTourneau-Westinghouse Distributor (Crook Company of Los Angeles and Bakersfield). Write us for more information or an on-the-job demonstration.

Tournarocker—Trademark Reg. U.S. Pat. Off., Tournatractor—Trademark RT-493-D-b

LeTourneau-Westinghouse Company | PEORIA, ILLINOIS

"WE'RE SOLD ON PHILLIPS 66—

Your Oils Give Us Top Notch Service"

That's what L. M. Chambers, General Superintendent of Bushman Construction Company, Kansas City, Missouri, has to say about Phillips *66* Heavy Duty Motor Oils. This company is now building a 12,000-foot runway and a 400,000 square yard parking apron for Forbes Air Force Base—the runway is 200 feet wide and 17 inches deep.

● Before the 12,000 feet of runway and the 400,000 square yard parking apron for Forbes Air Force Base are finished, over 600,000 barrels of cement will be poured. To get this vast amount of concrete down, 50 pieces of mobile equipment are on the job—everything from Koehring Pavers to Batch Trucks. Protecting all this equipment will be some 9,840 gallons of Phillips *66* Heavy Duty Motor Oils and Greases.

Bushman Construction Company has been using Phillips *66* products since 1946. Says Mr. Chambers: "I can't afford to be penny wise and dollar foolish. I use the best oils and greases. Every piece of equipment is lubricated every day. Oil is changed every 80 hours or sooner. There's no sense at all in not using the best oil you can buy and using it often.

"We're sold on Phillips *66*. Your oils give us top notch service. They have my recommendation any time."

Test Phillips 66 Heavy Duty Motor Oils against the oil you are now using. A Phillips 66 Lubrication Engineer will be glad to help you set up a test. Write to: Sales Department, Phillips Petroleum Company, Bartlesville, Oklahoma.

It's Performance That Counts!

PHILLIPS 66 HEAVY DUTY MOTOR OILS

"Does the work of 2 machines"

Pushing 2½-yd. bladeful of cover earth, Tournatractor finish-grades the drive-in site. Tire marks in foreground indicate how firmly Tournatractor has packed the loose trash of the former dump.

THE L & Z CONSTRUCTION COMPANY, Putnam, Connecticut, has just finished a grading job which accurately tested dirtmoving abilities of a 148 hp crawler-tractor, a 101 hp crawler, and a 186 hp rubber-tired Tournatractor.

The work consisted of turning an unsightly rubbish dump near Boston into a modern drive-in theater.

Eliminates need for roller

Of the 30,000 cubic yards of waste and trash which had to be leveled, Tournatractor alone handled half. The other 2 tractors each handled a fourth. Had the crawlers alone done the job, reports Raymond E. Leo, secretary-treasurer of the L & Z Company, sheepsfoot rollers would have been necessary. With Tournatractor on the job, big low-pressure tires so effectively compacted the trash in normal travel that rollers were not needed.

Needs less maintenance

Spreading and grading the 10,000 yards of cover dirt brought in by trucks, Tournatractor proved equally effective. Here, it dozed so fast (usually at 3.7 mph) and backed up so fast (usually at 8 mph) that it completed twice as many cycles as each of the crawlers. Says Mr. Leo, "Tournatractor did as much work on this job as the two track-type machines combined. It required less maintenance, too."

A major reason for Tournatractor's advantage over the crawlers is that it has more horsepower. Today's Tournatractor develops 208 hp . . . the two crawlers, 148 and 101 hp. Tournatractor also has more speed . . . 19 mph top, compared to 5 and 6 mph for the crawlers . . . 3.7 mph second gear compared to 2.3 and 2.2. Tournatractor also has less power loss. Its 4 rubber-tired wheels naturally roll easier than the 450 to 550 moving parts of a crawler track assembly. And the wheeled machine, with only 4 moving parts in place of hundreds, naturally needs less lubrication and less repair work.

Find out more

It will pay you to investigate *all* the maintenance and speed advantages of the LeTourneau-Westinghouse tractor-on-rubber. Let us show you Tournatractor in action so you can judge it for yourself. Call today to arrange a mutually-convenient time.

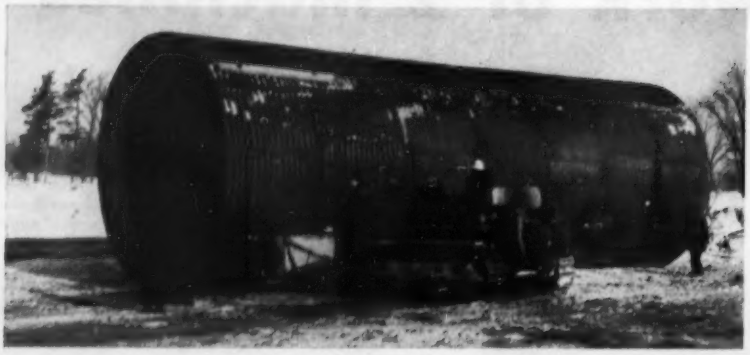
Imagine how much grit would be packed in around the idlers and rollers of your crawler's track assembly after one push through dirt like this. Because Tournatractor rolls over the dirt instead of grinding through it, this rubber-tired machine often gives you faster cycles and less maintenance than crawlers.

Tournatractor—Trademark T-700-8-b

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company



TUBE IS ROLLED from assembly site into position for moving it into trench. This section is 56 ft long, 16½ ft in dia, and is made of ungalvanized Armco Multi-Plate units.

LENGTH IS SKIDDED into trench on sheet of steel plate to which it is blocked by timbers. Internal tie rods temporarily deform circular tube to five-percent elliptical shape.

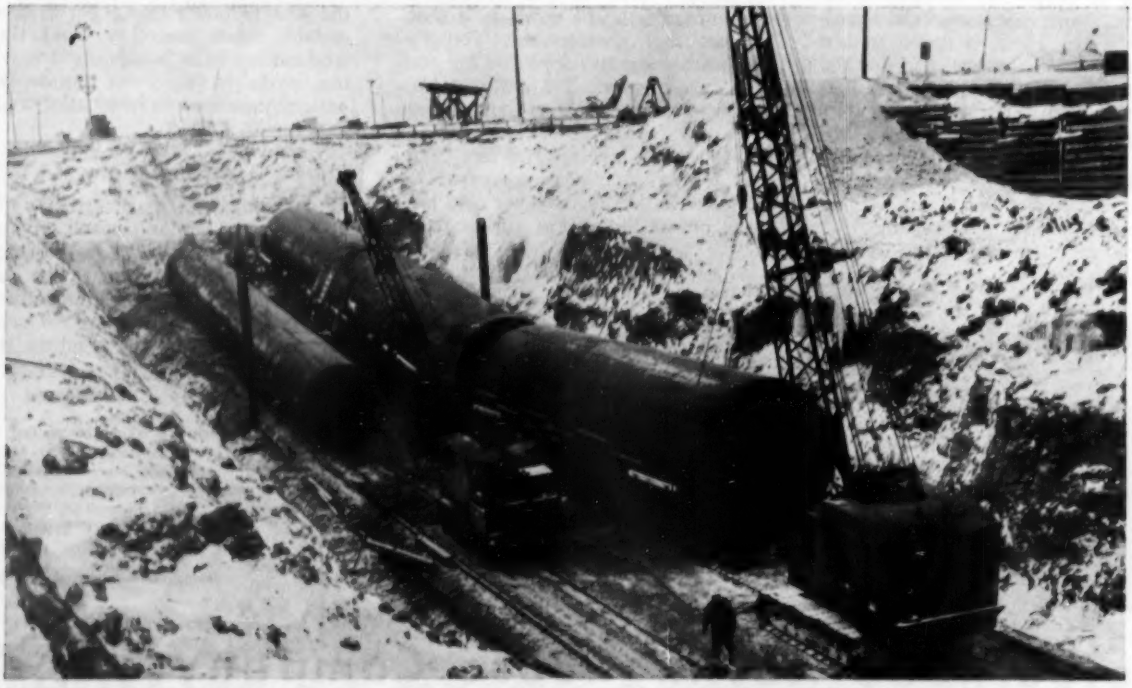
flume by up- and downstream timber-crib cofferdams faced with sheetpiling and filled with gravel.

Between the cofferdams the canal was dewatered, and its bed trenched transversely to a minimum depth of some 30 ft to accommodate the tubes. Next, a 12-in. gravel base was placed. On this was poured a 12-in. concrete slab for the small tunnel and a 30-in. slab for the large one, both then covered with a 24-in. bedding layer of crushed rock.

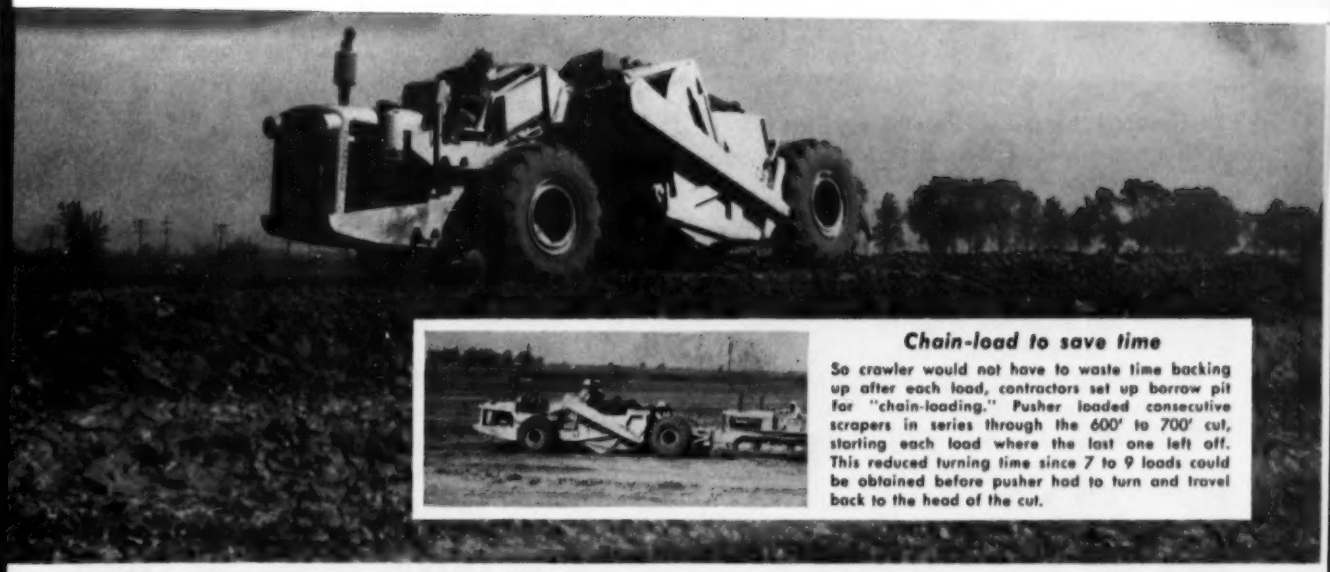
Meanwhile, Ontario Hydro crews under the direction of Armco's construction department were assembling tunnel sections on the canal bank alongside the cut. Plates were fitted together easily and held by a few bolts, then final fit-up was handled by air wrenches. Because the tubes had to be watertight (there was to be only a minimum 6 ft of gravel and dirt between final tunnel top and canal bottom) special 3/16-in. Goodrich Neoprene washers were set under bolt heads and nuts. In addition, all circumferential and longitudinal seams were bead welded inside and out. And all bolt heads were daubed with a waterproofing compound.

Assembled tunnel sections—100 ft long for the 10-ft tube and 56 ft for the other—were rolled on to

(Continued on page 143)



SECTION IS POSITIONED by Lorain truck-crane and Dominion crawler. What appear to be lines of open-tile drain on trench floor are really steel pipes anchored to underlying concrete slab, and to which the tunnels will be hook-bolted to prevent uplift.



Chain-load to save time

So crawler would not have to waste time backing up after each load, contractors set up borrow pit for "chain-loading." Pusher loaded consecutive scrapers in series through the 600' to 700' cut, starting each load where the last one left off. This reduced turning time since 7 to 9 loads could be obtained before pusher had to turn and travel back to the head of the cut.

How General Paving did 11 weeks work in 37 days

GENERAL PAVING COMPANY, Champaign, Illinois, usually use their 2 D Tournapulls for finish work and other small-yardage self-loading assignments. Yet, ample capacity and high working speeds make these 7-yd. "handymen" practical and profitable to fit in with a fleet of larger rigs when the company wants to get more dirt moving on the big cuts.

This versatility proved particularly important to General when they relocated 9½ miles of State Hwy. 45 near Rantoul. Here, 450,000 cu. yds. of hard clay, gumbo, topsoil, and wet sand had to be moved in a few months.

Tournatractor's main job on this contract was leveling and compacting the fill. The 6 sheepsfoot rollers being pulled total 26,400 lbs. Rig also tows equipment, push-loads scrapers, takes out trees, and handles scattered dozing assignments.

In order to meet the tight schedule, contractors started dirt work in late winter with the 2 "D's", 2 larger electric-control "C's", 2 Super C Tournapulls, and a rubber-tired Tournatractor. Bad weather interfered, however. During the first 13 work weeks, the job had to shut down completely for 6 weeks. When the rain and snow finally stopped, contractors put all 6 Tournapulls on production work and the Tournatractor on the fill.

Move 312 yds. hourly

Even then, the going was rough. At the time these photos were taken, loads were being taken from a wet 10-ft. cut that was difficult to enter because of the steep side slopes. Despite this, time studies made on 2-mile cycles show all 6 Tournapulls each delivering 5 to 6 loads per 50-minute hour. On a yardage basis, the two 7-yd. "D's" moved a total of 69 pay yards of clay hourly; the two 15-yd. Super "C's", 111 pay yards; the two 16-yd. electric "C's", 132 pay yards. Combined output: 312 cu. yds.

With this high rate of output, 45% of total yardage was moved in 37 working days! Instead of being way behind schedule, the job was slightly ahead. By the time the job was over, the 4 electric-control Tournapulls had worked so fast they had moved 75% of all dirt. The 2 mechanically-controlled Super "C's" and a fleet of fifteen 5-yd. trucks, working with an elevating grader in the easiest dirt, moved the remaining 25%. Compaction for both scrapers and trucks was handled by the 1 Tournatractor pulling 6 sheepsfoot rollers.

Supt. likes maneuverability

As you might expect from this performance, users are well satisfied with their LeTourneau-Westinghouse machines. Says General Superintendent Tom Kelly, "We like the 90° turn of the electric Tournapulls—particularly on a narrow fill or roadway."

Dirt Superintendent Dan Kelly adds: "These LeTourneau-Westinghouse machines sure operate easy. They move a lot of dirt. Of all the equipment we've ever had, we've had less downtime with Tournapulls and Tournatractors than with any others."

Ask for a demonstration

Like General Paving Company, you will find it pays to include fast, versatile Tournapulls and Tournatractors in your fleet. Get all the facts on performance, prices, and delivery from us today. There's no obligation.

Important Horsepower Changes

	Former Machines	Present Production Models
D Tournapull*	122 hp	138 hp
C Tournapull*	186 hp	208 hp
B Tournapull	None	293 hp
Tournatractor*	186 hp	208 hp

*Machines on this job are the earlier models

Tournapull—Trademark Reg. U.S. Pat. Off.
Tournatractor—Trademark TDP-688-H-b

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

It's tire-tough, because it's built the way a tire is—with *an exclusive hose construction no other maker matches.*

Proved in mines and quarries everywhere, U. S. Royal Cord Hose offers extremely high hydrostatic value, with a minimum of contraction and elongation. And with its great flexibility, shear resistance and toughness, it can be run over repeatedly by heavy equipment without harm.

Recommended particularly for applications where shock and excessive pressures are met, U. S. Royal Cord is available in continuous lengths from any of our 27 District Sales Offices, or by writing to the address below. *Whatever* your hose requirement, you'll find it pays to turn to "U. S." There's a job-engineered U. S. Hose for practically every purpose—an expert staff of "U.S." engineers to assist you in your hose selection.

This hose took a tip from a tire!

U. S. Royal Cord Air Hose

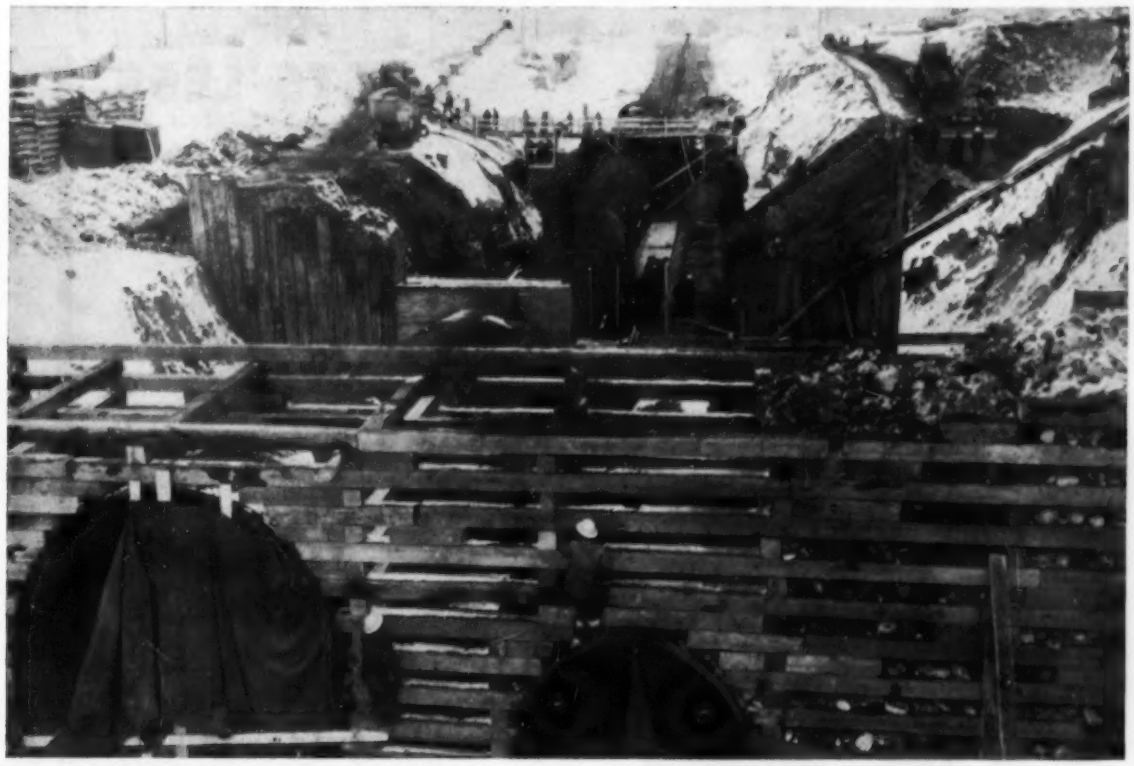
* tube of high quality neoprene for maximum oil resistance.
* braided cotton breaker ply anchors tube to carcass lastingly.
* Exclusive. Two counter-spiralled plies of tough special cord floated in resilient rubber for outstanding strength, shear resistance and flexibility.
* tough, brown natural rubber cover gives excellent cut and abrasion resistance—protects unique construction under extreme service conditions.

"U.S." Research perfects it..."U.S." Production builds it... U.S. Industry depends on it.

UNITED STATES RUBBER COMPANY

MECHANICAL GOODS DIVISION · ROCKEFELLER CENTER, NEW YORK 20, N. Y.

Hose • Belting • Expansion Joints • Rubber-to-metal Products • Oil Field Specialties • Plastic Pipe and Fittings • Grinding Wheels • Packings • Tapes Molded and Extruded Rubber and Plastic Products • Protective Linings and Coatings • Conductive Rubber • Adhesives • Roll Coverings • Mats and Matting



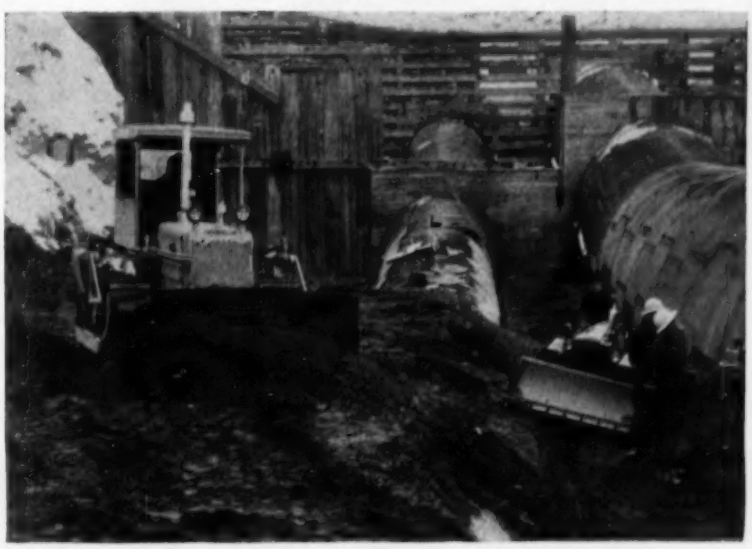
PORTAL IS BUILT of timber cribbing filled with gravel, as were cofferdams (one at far left) that permitted work in the dry. Behind portal is concrete-and-sheetpile cutoff wall to prevent seepage where tunnels will pass beneath replaced canal bank.

sled runners by bulldozer. Then they were pulled into the excavated trench and positioned by two cranes. Rather than butt adjoining sections, these were set one 6- or 8-ft plate-length apart to facilitate fit-up and bolting. After connecting plates were attached, field joints were welded.

When the tubes were in place, they were anchored to the underlying concrete slab by hook bolts on 24-in. centers to resist uplift. Gravel backfill was then placed and carefully compacted to a height of 2 ft above the top of the large tube. On this went a minimum 4-ft blanket of material originally excavated from the trench.

Where the tubes pass through the canal banks, concrete and sheetpile cutoff walls were built to envelop them to prevent seepage. And where the tubes emerge from the banks, 16-ft thick rock-filled timber cribs were installed as portal facings.

Final operations included paving of tunnel inverts, painting of interiors, and installation of lights, traffic signals and conveyor. In April, cofferdams had been removed and canal flow resumed.



BACKFILL IS SPREAD around both tubes by Caterpillar D2 and John Deere bulldozers after it has been dumped down the slope by haul truck. It will be compacted by Barco rammers.

The two tunnels were designed and built by the Hydro-Electric Power Commission of Ontario's Generation Department. Job engineer-inspector was Thomas McNeice, and Neil Mustard was engineer in charge of soils and concrete. Construction superintendents on tube assembly for Armco Drainage & Metal Products of Canada, Ltd., were Gilbert Hogg and George Crombie.

COSTS LESS

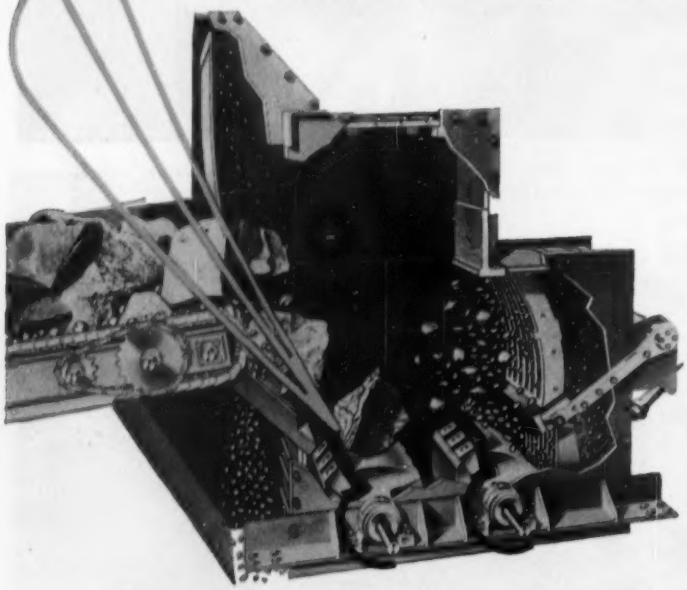
High ratio of reduction. One machine does combined primary and secondary reduction job . . lower initial cost.

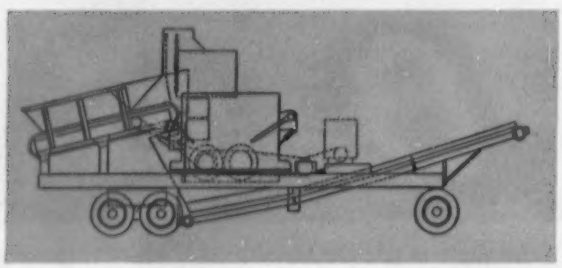
BREAKS CLEANER, FASTER

Two hammer rotors turn in the same direction . . . . eliminate congesting of breaker, promote faster feeding, faster discharge, increased capacity.

UNIVERSAL IMPACT MASTER

Featuring Universal's exclusive operating principle: Controlled Impact Action.





Portable Impact Master with apron feeder, folding discharge conveyor, three-speed transmission, and power.

It's no wonder Universal's Impact Master is the most efficient breaker you can buy. It can eliminate secondary crushers, take shovel-loaded run-of-quarry rock and reduce it to finished size in three seconds.

Here is why the Impact Master breaks rock faster and more economically. Both rotors turn in the same direction, assuring straight line flow of broken material away from hammers. Radial feed and absence of congestion provide unrestricted penetration of rock into the hammer circle for perfect impact. Hammers are always clean, always ready to break incoming rock most efficiently.

This saves you money because fewer hammer blows are required to do the job . . . less wear throughout machine . . . less horsepower.

Result: increased capacity of clean, cubical aggregate. What's more, finished product size is controlled easily with simple mechanical adjustments.

Universal's Impact Master provides capacities up to 1000 tons per hour. Get complete profit-making facts now. Write for literature.

Available in portable or stationary set-ups.

The method of impact breaking which permits control of feeding, breaking and product size.

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A Subsidiary of Pettibone Mulliken Corporation,
4700 W. Division St., Chicago 51, Illinois

PETTIBONE UNIVERSAL
IN CEDAR RAPIDS SINCE 1906

Monitored by instrument, this carefully controlled test shot is part of . . .

A Practical Lesson in Safe Blasting

ACCELEROGRAPH, which measures magnitude and direction of earth tremors from test blast, is explained to Contractor Ralph DeFelice (c) by Liberty Mutual's Arthur Gordon (r) and Richard Ford.

THE CONSTRUCTION FIELD has put more effort into safety and accident control during the last 5 yr than in all the 25 that preceded them. That is the opinion of Ralph DeFelice, of L. G. DeFelice & Son, who has himself just set a model of safe procedure in opening blasting operations. DeFelice, first contractor to begin work on the 123-mi Greenwich-Killingly (Conn.) Expressway, staged a safety-controlled test blast before beginning full-scale operations. Purpose of the test was to determine the blast pattern and quantities of dynamite that could be used without damage to near-by structures. By thus holding down any possible property liability claims, DeFelice will also hold down his insurance costs.

The test provided data for blasting operations along DeFelice's 5-mi, $4,000,000 section of the super highway. Preparation and analysis of the test were made by Liberty Mutual Insurance Co.

Tables on pages 146 and 147 give test blast data. The shot itself, of course, was not made blindly. From data obtained in previous blasting operations, DeFelice had been provided by his insurer with a general formula for setting up the test. According to this formula, it was possible to set off the 1,700 lb of 65% dynamite in 8 microsecond delays and still remain well within a margin of safety for the surrounding buildings. But because of the unknown "ground factor," i.e., the exact earth and *(Continued on next page)*

KEEP THIS SHEET ON FILE

DAILY BLASTING LOG

CONTRACTOR: L. G. De Felice & Son
JOB LOCATION: Westbrook, Conn.
BLAST STATION: 1310 + 50
TYPE OF BLAST: Side Hill
Trench, side hill, etc.
TYPE OF ROCK BLASTED: Granite
TYPE OF DYNAMITE AND SIZE: Gelamite #2 Hercules
TYPE OF DELAY: 0-7 E.P.
CLOSEST BUILDING: 1000' N. W.

TYPE OF JOB: Super Highway
DATE: April 7, 195[illegible] TIME OF BLAST: 3:31 P.M.
WEATHER:
Direction & Velocity of Wind: S. E.
Temperature: 45°
Relative Humidity:
Cloud Condition: Cloudy
REMARKS:
DISTANCE OF THROW: Small

BLASTING DATA

DELAY NO.	NO. OF HOLES	HOLE DEPTH	NO. OF STICKS	NO. OF POUNDS
0	11	12'	203	133
1	23	12'	458	300
2	24	13'	485	318
3	24	13'	475	311
4	20	15'	379	248
5	12	15'	221	145
6	12	16'	237	155
7	7	16'	139	90
8				
9				
10				
etc.				
TOTAL	133		2597	1700#

Powder Factor = .21 lbs./cu. yd.
Blasting Pattern on reverse side by plans & section

Paul Harrison
Blaster's signature

BL #1

BLASTING LOG for test shot is only first step in DeFelice's careful record-keeping program. Similar logs will be prepared for documenting each subsequent blast on 5-mi project.

rock structure within the area, a maximum and yet safe charge could not be established by formula alone.

The determination of the ground factor was the work of an "accelerograph"—a $2,000 instrument developed by Liberty engineers to measure earth tremors caused by blasting.

In principle and operation the accelerograph is relatively simple. Three reeds, set at right angles to each other in three different planes, are activated by blast vibrations. Each of the reeds has a small concave mirror attached to it which picks up a light source and reflects it on to a moving 70mm film. The film record is, in effect, already an analysis of the blast vibration in the vertical, transverse, and longitudinal planes. It provides data for an exact analysis of the nature of the tremors, their direction, acceleration and destructive force at various distances.

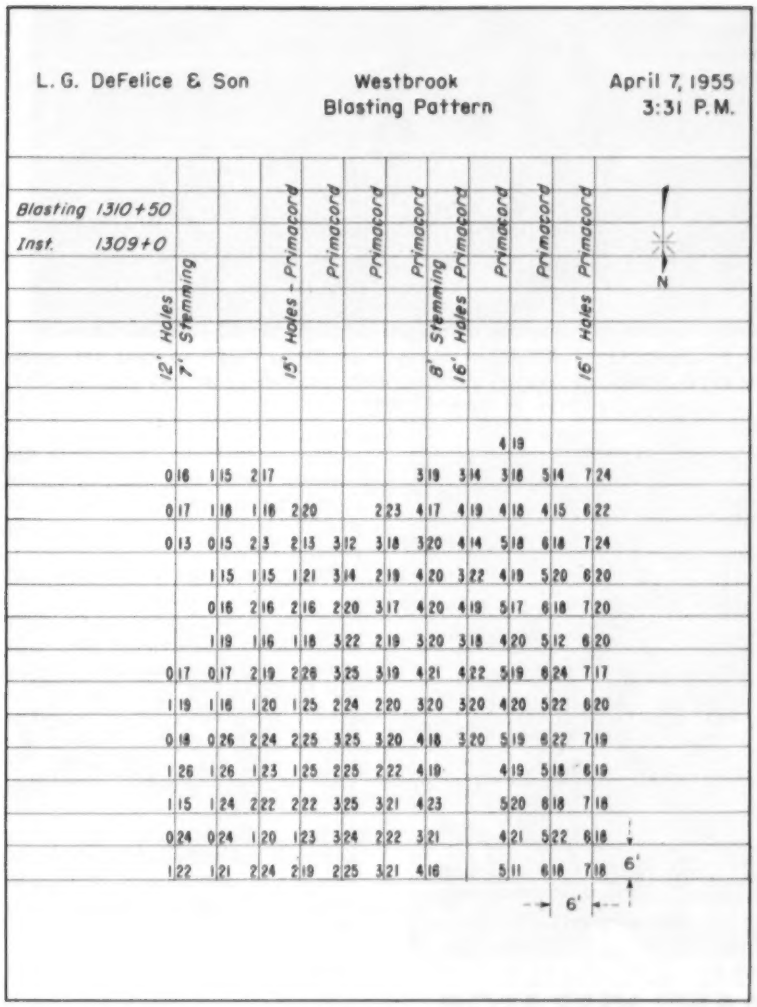
A print of the accelerograph film made at the DeFelice test site is shown on page 148. From the film, Liberty Mutual's Assistant Chief Engineer Arthur Gordon computed the ground factor which was unknown at the time the test was set up. This came out 0.001, based on shooting with Hercules Gelamite No. 2.

Once this factor was known, it was possible to determine whether or not the blast could have endangered the closest buildings. Without getting into technical details, the calculation was made as follows:

Basic formula for setting up any blast (the test, in this case):

$$\left(\frac{50}{D}\right)^2 C^2 K = ER$$

L. G. DeFelice & Son — Westbrook Blasting Pattern — April 7, 1955 3:31 P.M.



BLASTING PATTERN for test shot shows hole spacing, delays, number of sticks per hole, and amount of stemming. It becomes important part of blasting log in event of lawsuits.

D = Distance (ft to nearest building)
C = Dynamite (lb per typical delay)
K = Ground transmission factor
ER = Energy ratio

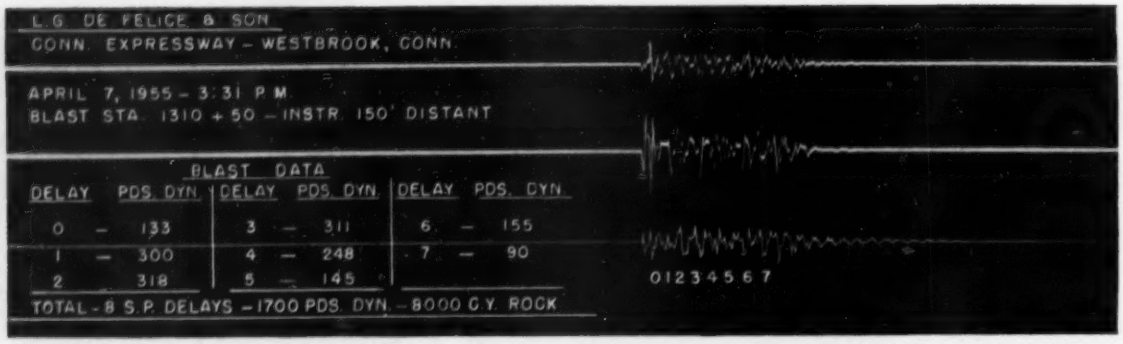
Substituting test-blast figures of 1,000-ft distance, 300 lb of powder in a delay and the computed K of 0.001 gave an ER of 0.225.

Based on extensive experimentation, the company has found that for the protection of normally constructed buidings, ER should not be greater than 3. And for old, poorly built structures, it should be considerably lower. In the DeFelice test the situation was complicated by two near-by antique shops where damage could conceivably have been done, not simply to the buildings, but to irreplaceable objects. However, an ER of 0.225 was well below the allowable level, so Gordon's conclusion seemed amply justified: "The results of the test indicated that all the test blasting on this site was within a safe limit. There was not any possibility of causing damage from the amounts of dynamite used."

Of course, the test blast was deliberately set up to be on the safe side. All of DeFelice's blasting will not be so comfortably removed from surrounding buildings. When his shots approach closer to structures, the conclusions drawn from the test will be of paramount importance.

Based on the computation for the ground factor K, the report included an easy-to-read graph (page 150) giving safe quantities of dynamite usable at various distances from any building.

Further, it is conceivable, though unlikely, that there may be a



ACCELEROGRAPH RECORD is an analysis of blast vibrations in three different planes—vertical, transverse and longitudinal. Record is made on moving 70-mm film by three reeds fitted with mirrors to reflect light source, and which are activated by blast.

change in rock structure along the blasting route. In such a case, the report recommends the staging of another test to determine the new ground factor.

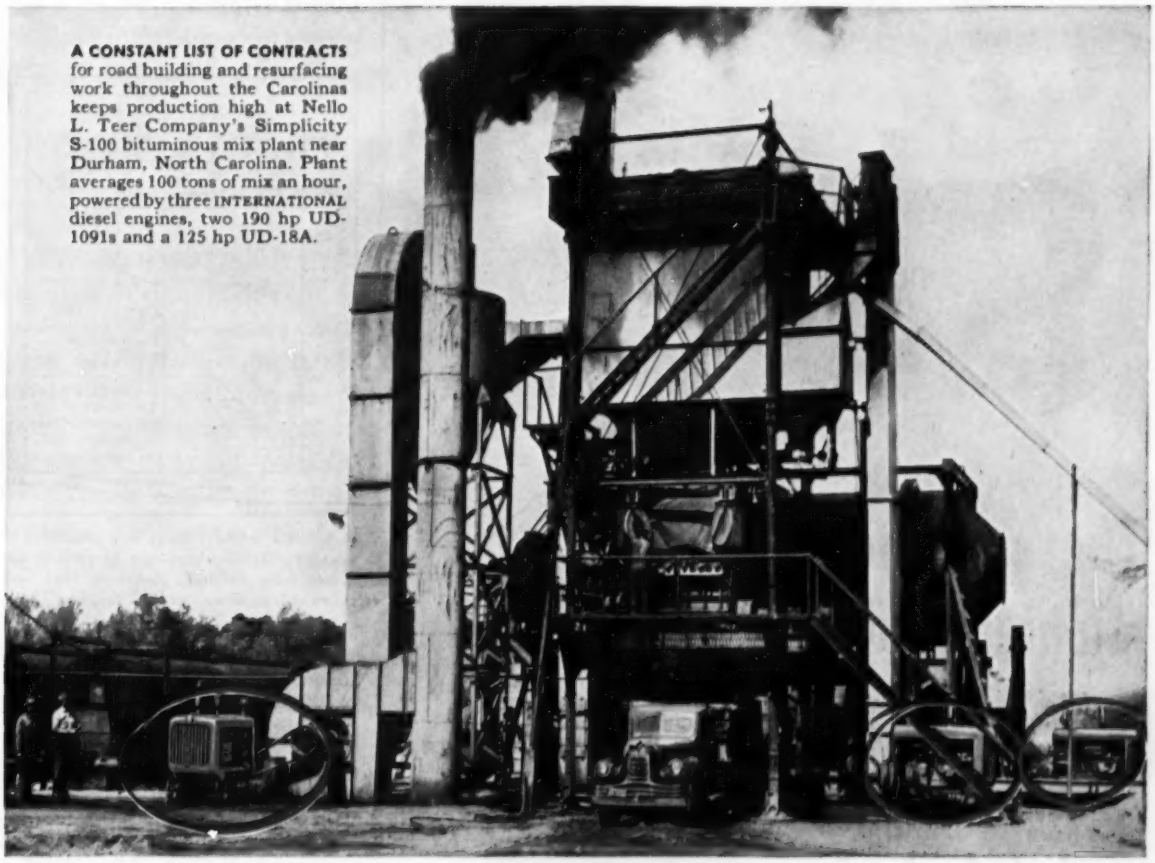
These tests are important, and an accurate use of the blasting formula is dependent upon their findings. In a critical blasting operation, the foreman could follow the formula and still use a dangerous charge due to a wrong estimate of the ground factor. By using a test charge well under the limit thought possible and then taking a reading from the accelerograph, a guide for the maximum and yet safe charge throughout the area can be determined. There will then be no guesswork about possible damage to surrounding property.

Helps Fight Lawsuits

A second reason for the tests is the impressive role the accelerograph record can play in case of lawsuits. Providing the contractor follows the blast pattern and dynamite quantities recommended in the record, the accelerograph reading can save him considerable time and money in the handling of the false claims which seem to be an inevitable part of any blasting operation.

Experimentation has shown that human response to vibration starts at a level about 1/100 of that necessary to injure even poorly constructed buildings. A vibration at 1/5 the level damaging to structures can be severe and startling to a building occupant. These vibrations, coupled with the noise of the blast, are usually enough to provoke false property damage claims. The accelerograph test and a careful record of the blasting operations based on this test pro-

(Continued on page 150)



A CONSTANT LIST OF CONTRACTS for road building and resurfacing work throughout the Carolinas keeps production high at Nello L. Teer Company's Simplicity S-100 bituminous mix plant near Durham, North Carolina. Plant averages 100 tons of mix an hour, powered by three INTERNATIONAL diesel engines, two 190 hp UD-1091s and a 125 hp UD-18A.

"You can't beat INTERNATIONAL DIESELS for continuous power"

Lugging power keeps output high, reports Asphalt Plant Superintendent

Keeping ahead of the many calls for bituminous mix keeps the Simplicity S-100 asphalt plant, owned by Nello L. Teer Company, Durham, North Carolina, busy most of the time.

Insurance against power break-down, with resulting production snarls, loss of time and money, is provided by three INTERNATIONAL diesel engines.

A 190 hp UD-1091 pulls the tower, another UD-1091 is on the dryer, and the third INTERNATIONAL diesel, a 125 hp UD-18A, pulls the fan.

According to Superintendent R. L. Bean, *"We've got* INTERNATIONAL *diesel engines on this job for one good reason: They just can't be topped for asphalt plant power. That's based on 14 years' experience with all types of power.*

"The INTERNATIONALS *develop continuous lugging power that keeps production to full capacity without undue engine wear.*

"Years of satisfactory service makes me a booster of INTERNATIONAL *Power."*

If your job calls for heavy-duty power, an INTERNATIONAL engine will do the job better.

There are 18 models ranging from 16.5 to 200 net horsepower in the new line of INTERNATIONAL Power, including five 4-cylinder carbureted power packages, seven 6-cylinder carbureted power units and six diesels in 4- and 6-cylinder models.

You get the benefit of more than 50 years' experience in pioneering and perfecting such features as valve-in-head construction, replaceable cylinder sleeves, induction hardened crankshafts, precision type replaceable bearings . . . and in diesels, all-weather gasoline conversion starting, single plunger injection pumps, positive torque control and micronic full-flow oil filtration. It will pay you to specify INTERNATIONAL for dependable power in your new equipment . . . and to repower with INTERNATIONAL when it's time to replace your present engines.

Call your nearest INTERNATIONAL Power Unit Distributor or Dealer today.

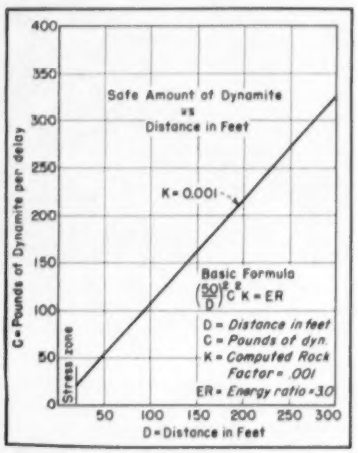
INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

INTERNATIONAL HARVESTER

INTERNATIONAL
INDUSTRIAL POWER
MAKES EVERY LOAD A PAYLOAD

SAFE BLASTING . . .

Continued from page 148



BLASTING GRAPH shows safe quantities of dynamite DeFelice can use at various distances from buildings, assuming that rock structure is same as at test-blast site.

vide the contractor with a sound defense against them.

As another precaution, a daily blasting log supplied by the insurer was begun at the test and is being continued by DeFelice throughout the blasting operations. This log, which provides a permanent record of pertinent data on each shot (such as number of holes, delay pattern, type and quantity of dynamite, wind, time and station of blast), is kept on file for ready reference in the event of any liability claims.

Warn Near-by Residents

Despite the fact that the test blast was conducted at a known safety level, the acute degree of human sensitivity to blast vibrations could easily have led near-by residents to fear that their property might be damaged by the blast. This was especially true in the test case, since two of the buildings were antique shops. It was also possible that a loosely hung object, or one precariously balanced on a shelf, could have been dislodged even by the relatively small vibration at the 1,000-ft distance. In order to preclude such a fear or minor mishap, Liberty Mutual recommended the contractor inform the occupants of the blast time, have them secure objects which could possibly be dislodged, and open windows to minimize concussion effect of the blast.

These precautions were taken,

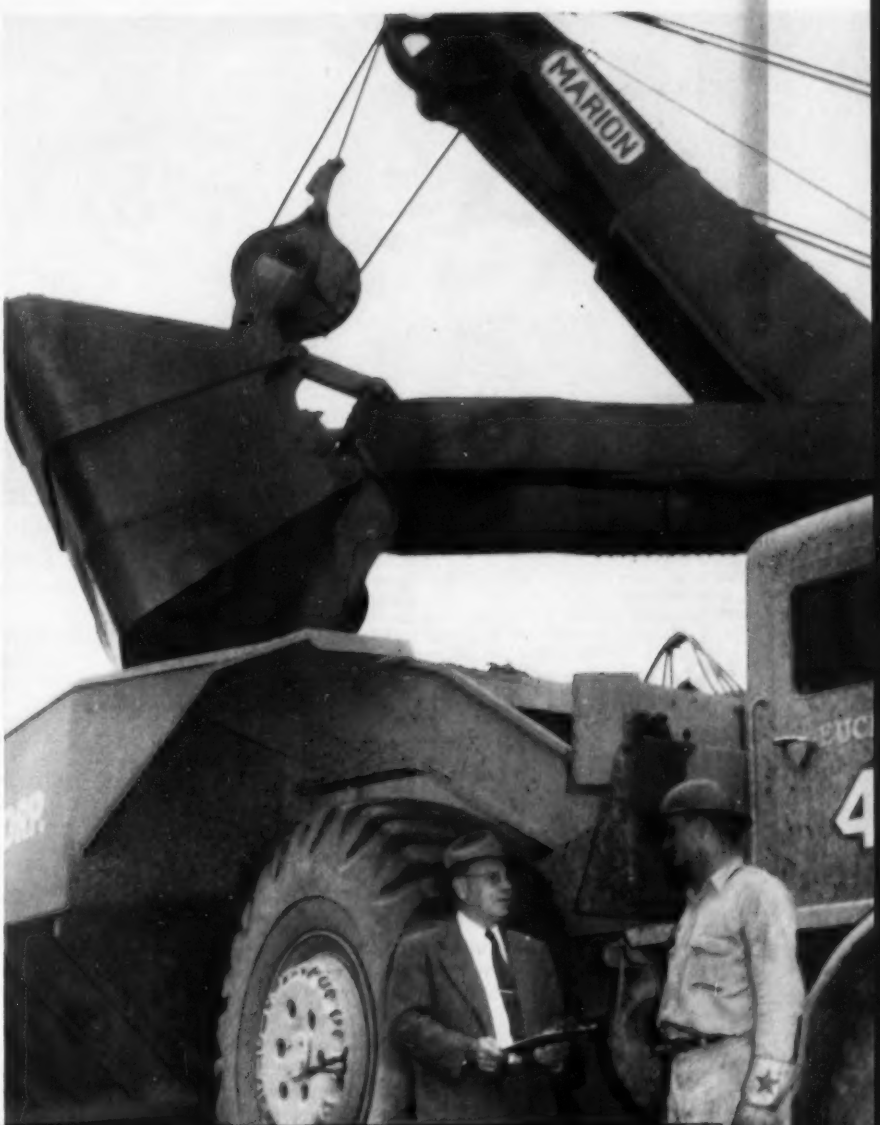
(Continued on page 183)

STANOLITH MP *Grease—a single grease—lubricates all equipment at Wright Mine*

THE BOONVILLE COLLIERIES Corporation's Wright Mine uses STANOLITH MP Grease to lubricate all grease-lubricated bearings. To Wright Mine management this is good business. Using a single but multi-purpose grease, the management finds, cuts grease inventories, reduces grease dispensing equipment and, in application, eliminates costly dispensing mistakes.

Roller, ball, plain, and needle bearings are lubricated by this one grease. This applies to all mine equipment—Marion stripper, loading shovel and dragline; 7 Euclid 45-ton coal haulers; two Caterpillar D8 Bulldozers and two International Harvester tractors.

Using STANOLITH MP Grease saves Wright Mine money. It can save you money, too. Find out. In the Midwest, call your nearby Standard Oil lubrication specialist. Or contact Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.



Marlin Carter, Wright Mine pit foreman (right), and Oscar Daussman, Standard Oil lubrication specialist, discuss equipment lubrication. Oscar is an old hand at providing technical service on lubrication problems. He has had more than 30 years' experience with Standard Oil, much of it working with customers on such lubrication jobs as this one at Wright Mine. Customers find this experience pays off *for them.*

STANDARD

STANDARD OIL COMPANY
(Indiana)

NEW ALL-PURPOSE WAGON can carry 25-yd heaped loads, as well as handle big rock as shown here. The Movall's positive cable ejection, with 140,000 lb thrust pushes out the rock at the operator's discretion. Center of gravity stays low while dumping.

"Scraper In Reverse" Design in New 31-Ton Hauling Unit

By RALPH H. LEWIS, Associate Editor

C & D MANUFACTURING CO., of Perkins (near Sacramento) Calif., wanted to build a new type of hauling unit for contractors. But before they settled on the final design, they wisely surveyed the contracting field to learn what the contractors wanted in an "ideal" machine. They found out from a good source—the man in the field—how such a machine compares with other types of hauling units presently in use, and the findings altered their design plans. The result is a 25-cu yd (heaped) 31-ton Movall all-purpose wagon which has a unique "scraper in reverse" positive unloading feature.

The scraper in reverse idea is the real story behind this rig. Actually, all you have to do to understand the unloading principle in the Movall is just to picture a scraper turned around. The Movall's cable-powered ejector shoves the load out to the rear instead of forward. It even uses the same two-line cable control as a scraper, thus eliminating modifications or attachments. It's a good feature, as it gives positive dumping action on such materials as mud, frozen or sticky materials. It permits the operator to spread material on the fly in even lifts, dumps in corners and into hoppers, with quantity controlled by the operator. And of course, the simplified cable-control should be attractive to the contractor from a maintenance angle.

Actually, the Movall will do everything the scraper does except self-load and grade its own, or previously dumped loads. It will also do a couple of things the scraper cannot do—dump clear of its own wheels and can take the punishment of handling rock with big shovel loading. Proof the Movall can take it under rough conditions is best said by well-known contractor Louis Berlanti, president of Berlanti Construction Co., Harrison, N. Y., who owns four rigs. "The positive ejection features enable the Movall to handle all types of material."

Prime Movers Can Be Changed

The survey showed contractors wanted a rig that could be interchangeable in the field without expensive attachments and modifications. The Movall makes it comparatively easy to switch prime movers on the job. Standard yokes are available for the Cat DW20 and DW21. Adapter yokes for other prime movers are available, and the change can be made by two mechanics in 4 to 8 hr.

Construction Details

• **Heavy-duty rock body** is formed of high tensile steel plates ½ in. thick on the sides, with hardwood-

(Continued on page 155)

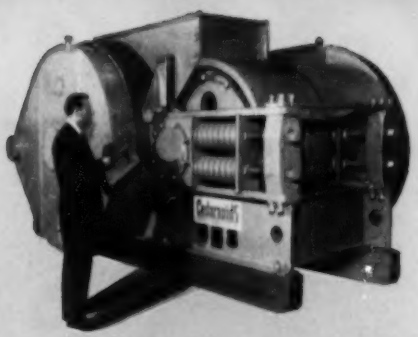
BIG MACHINES

BIG PROFIT

BIG PRODUCTION

Cedarapids

Built by IOWA

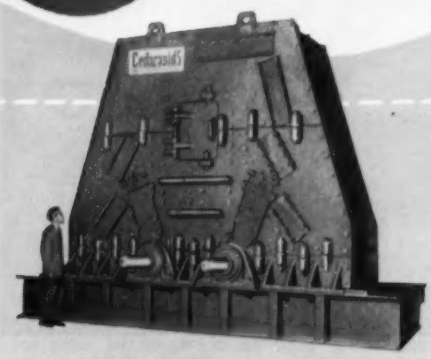


ROLL CRUSHERS

This new 55" x 30" Roll Crusher is a *big* producer for secondary crushing operations. Large diameter of the rolls handles exceptionally large feed. With 20% wider roll shells, capacities range up to 520 tons per hour, depending upon conditions.

8 ROLL CRUSHER SIZES MEET EVERY NEED

16" x 16"	30" x 18"	30" x 25"	40" x 24"
24" x 16"	30" x 22"	40" x 22"	55" x 30"

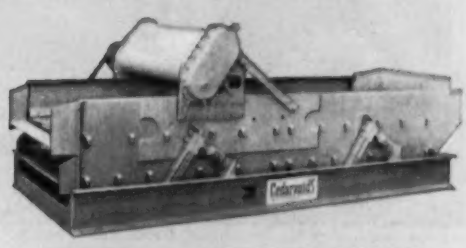


DOUBLE IMPELLER IMPACT BREAKERS

This big Breaker reduces rock from 53" x 60" down to 3" minus in one pass and turns out from 500 to 800 tons of ideal cubical shaped aggregate per hour!

AVAILABLE IN 7 SIZES

For portable or stationary plants	For stationary applications
Model 2222	Model 4350 Standard
Model 3042	Model 4350 Heavy-Duty
Model 3645	Model 5360 Standard
	Model 5360 Heavy-Duty



HORIZONTAL VIBRATING SCREENS

The *horizontal* position of the screen cloth openings permit *more* of the correct size material to go through the screen, yielding 20% to 30% more accurate gradation and more yards per hour. A horizontal screen provides as much as 12½% greater screening area than an inclined screen of the same length! You can use a smaller screen, get the same capacities as with a larger inclined screen.

Available in single, double and triple deck models in sizes ranging from 3' x 8' to 48" x 14'.

JAW CRUSHERS

The big 32" x 40" Jaw Crusher is the ideal unit for big primary crushing operations because it's engineered in every detail to give *extra* capacity with smooth, steady performance and low maintenance and operating costs.

AVAILABLE IN 12 SIZES

10" x 16"	15" x 24"	22" x 25"
10" x 20"	15" x 36"	22" x 36"
10" x 24"	18" x 24"	25" x 40"
10" x 36"	18" x 36"	32" x 40"

SYMONS® CONE CRUSHERS

Supplied as individual units or in Cedarapids Secondary Plants and Scalping Units. Nordberg-built Symons Cones give you big-volume, low-cost finished crushing of even the hardest or most abrasive rock or gravel to uniform, finely-crushed aggregate.

SIZES AVAILABLE

2', 2', 3' and 4'

SYMONS—A registered Nordberg trademark

IOWA MANUFACTURING COMPANY

CEDAR RAPIDS, IOWA, U.S.A.

NEW HAULING UNIT . . . Continued from page 152

IN DUMPED POSITION with ejector at end of travel. The load is scraped out so it is impossible to build up materials.

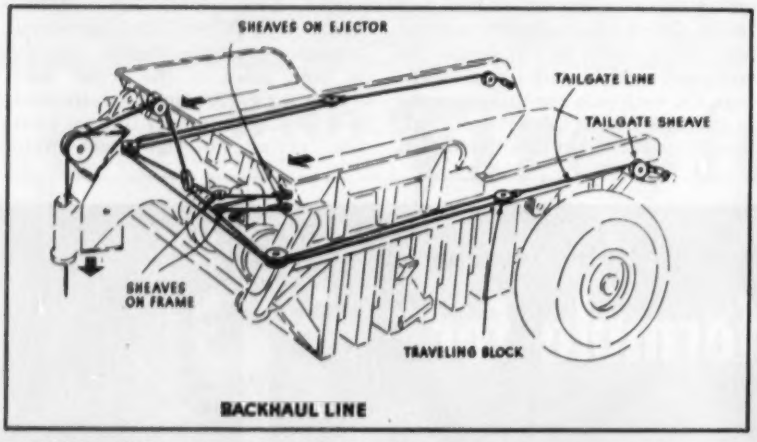
HERE'S THE MOVALL ready to load, with ejector forward and tailgate up. The rig's rated at 31 tons.

filled double bottom having a ¾-in. high-tensile steel top plate and longitudinal reinforcing bars on 12-in. centers. Deep-section box yokes girdle the body on 16-in. centers to prevent bowing. Alignment of the 1½-in. top rail, on which the ejector travels, is assured by heavily reinforced box-sections 10 in. wide at base and 12 in. high. These are formed from ⅝-in. plate, with a full-length 6x4x⅜-in. stiffener angle-welded inside. Target area is 11x19 ft. Height is 10 ft 4 in. at the front, 8 ft toward the rear.

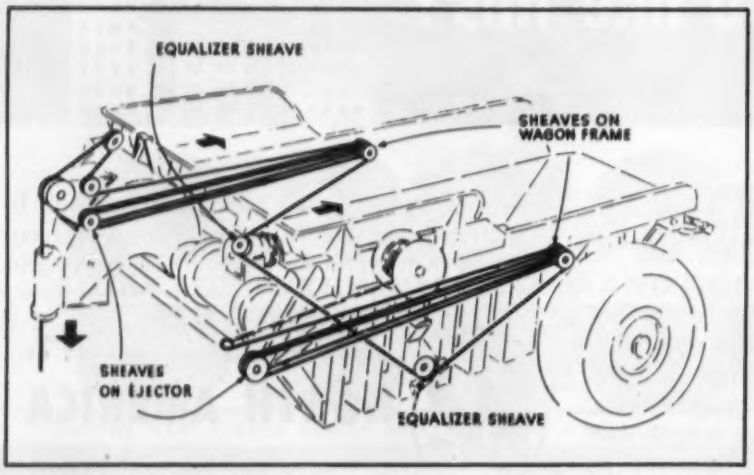
• **Ejector assembly** consists of a heavily reinforced ejector "blade" which rides on the top rails of the body. The 6,140-lb ejector assembly rides on 16 rollers, all equipped with anti-friction bearings. On each side are three traveling rollers to take the vertical load, three side rollers to take horizontal thrust, and two hook rollers. Removable sideboards are available to increase capacity in light materials.

• **Cable system is simple,** yet effective. The ejector line is 9/16-in. dia, 193 ft long, and is reeved through multiple-sheave blocks on both sides of the frame and ejector assembly in a continuous line. It is a four-part line on each side, giving an eight-part mul-

CONTROLLED DUMPING OR SPREADING is a feature of the Movall. The operator can spread the material in even lifts of any desired depth. It'll still dump with all wheels locked.



BACKHAUL LINE operates off second drum of power unit and passes through traveling blocks on each side connected to the tailgate cable. Stops prevent cable breakage.



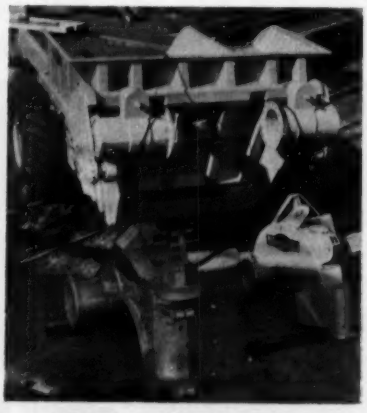
CABLE SYSTEM on the Movall is simple. It is of 9/16 in. dia, 193 ft long and is reeved through multiple-sheave blocks on both sides of the frame in a continuous line.

tiplication which provides 140,000-lb thrust on the ejector.

The backhaul line is 9/16 in. by 157 ft long. It operates off the second drum of the power-control unit and passes through traveling blocks on each side which are connected to the tailgate cable. It is then reeved through multiple-sheave blocks on the forward side of the ejector assembly and the front frame.

No springs or timing devices are used, other than stops to prevent cable breakage. To dump, the operator releases the backhaul drum which allows the tailgate to drop, then engages the ejector line drum. As the ejector is pulled back to clear out the load, the backhaul line feeds out. After dumping, the operator releases the ejector drum and engages the backhaul. The traveling blocks close the tailgate, and the line then retracts the ejector to its forward position.

• **The tailgate is hinged** at the bottom, swinging downward when released for dumping. It serves two purposes; (1) to permit heaped, full-capacity loads without excessive spillage in the loading areas or on haul roads, and (2) to keep dumped materials clear of the tires to prevent damage.



INTERCHANGE with different prime movers is provided by switching yokes. Cat DW21, left, and DW20 yokes are seen.

• **Tires are 24:00x29,** 24- or 36-ply optional, interchangeable with usual prime-mover tires. Wheels are equipped with tapered roller bearings protected by spring-loaded rawhide oil seals, mounted on a 6-in. dia straight-through axle. A 108-in. tread, with Movall's in-

(Continued on page 158)

One Man Drives 1600 Form Pins a Day!

Again Le Roi Tractair's portable air-power helps get more done—at less cost

When you're driving form pins at the rate of 200 an hour, you're saving money. And that's exactly what the Tractair unit is designed to do. Here's how:

Tractair is a combination 35-hp wheel tractor and 125 cfm compressor. This means it is extremely mobile—takes air-power almost anywhere you need it. It can do a lot of things for you — drill rock, tamp fill, break concrete, vibrate concrete. It can be fitted with attachments, too, so that you can load, backfill, sweep, and plow.

Yes, the Tractair unit can do 101 odd jobs for you, save you money on all of them, and you don't have to tie up trucks or men to use it. So write for our latest literature and find out how the versatility of Le Roi Tractair can help you cut costs on a wide variety of jobs.

T-38

LE ROI *Division of Westinghouse Air Brake Co.*

Milwaukee 14, Wisconsin

NATION-WIDE SALES-SERVICE NETWORK

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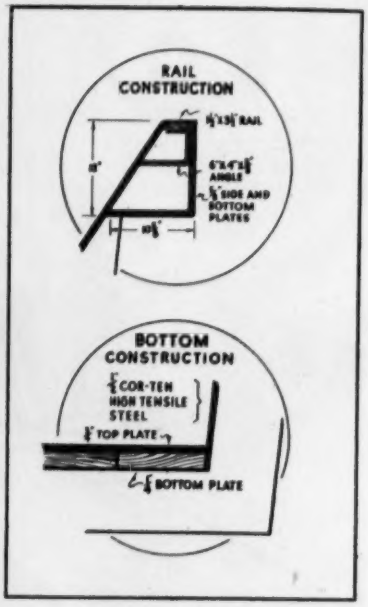
NEW HAULING UNIT . . .

Continued



BODY IS RUGGEDLY CONSTRUCTED. Box beams girdling the body on 16-in. centers prevent bowing. Body plates are of high tensile steel.

herent low center of gravity, gives excellent stability. Air-operated brakes, synchronized with tractor brakes, are 20 in. in dia, 8 in. wide.

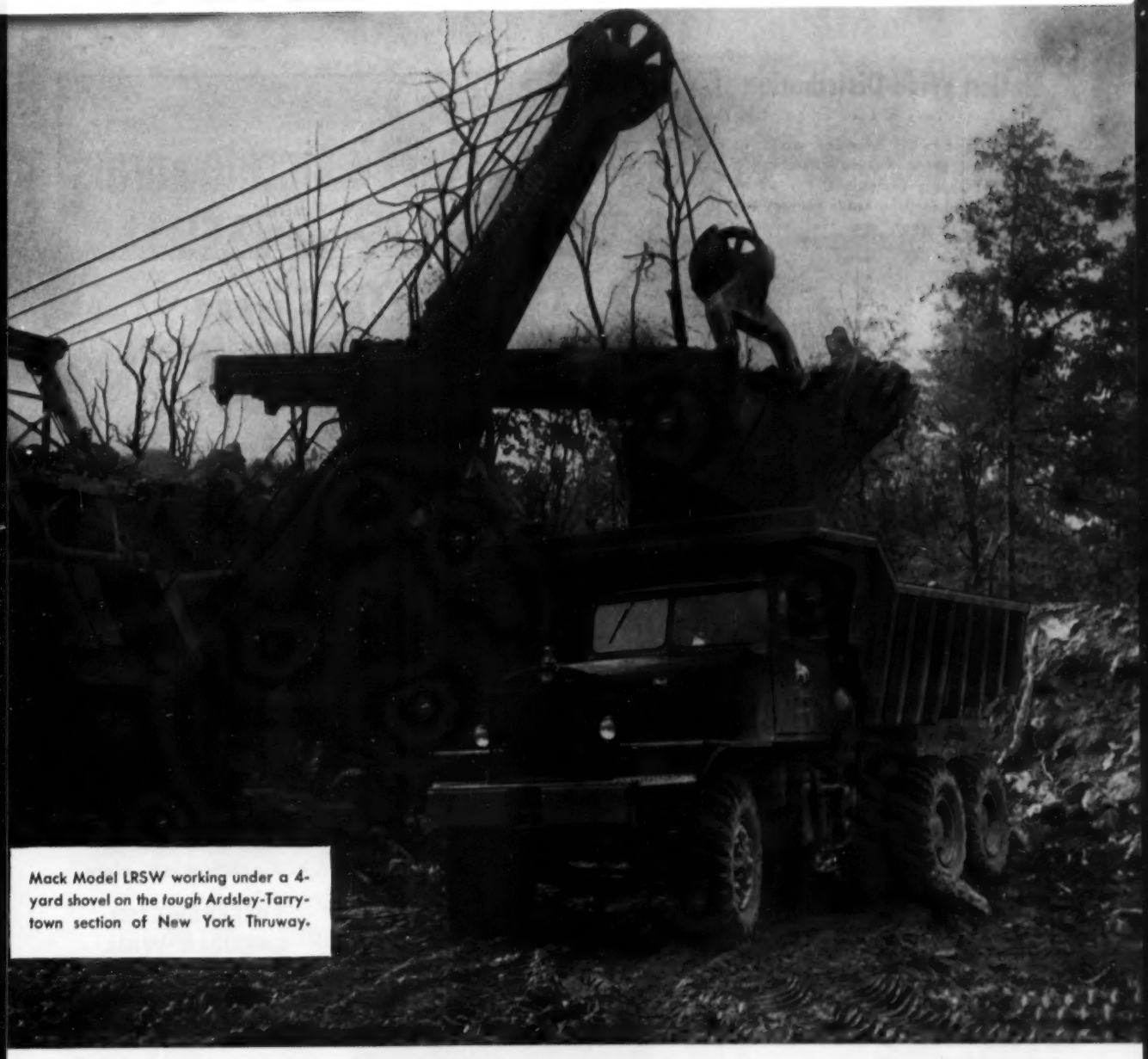
Price is competitive on the Movall. If you already own a Cat DW21 or DW20 with scraper cable controls, the price is $16,890 fob factory. That's with 36-ply tires. If you already have the tires, write a check for $14,520, and it's yours. If you have to start from scratch and buy the Cat DW20-Movall combination, you'll need $39,785. The DW21-Movall combination is a little cheaper, $38,951.

* * *

COMING — In July

Construction Methods and Equipment's special issue devoted to Construction Equipment Maintenance. The theme will be "Productive Maintenance."

WATCH FOR IT!



Mack Model LRSW working under a 4-yard shovel on the *tough* Ardsley-Tarrytown section of New York Thruway.

big shovels call for big trucks

Today's big-yardage jobs demand maximum loads per haul and faster time cycles from shovel to dumping point and return. Increasing use of big 4- and 5-yard shovels points to the Mack Model LRSW six-wheel dump truck as the answer to these stepped-up requirements.

Here's a truck that's built to keep big shovels on the go . . . to give contractors increased production per driver and per truck dollar invested.

Rated at 30 tons payload capacity, it will move 25 heaped yards with unfaltering ease over the toughest terrain. No miring in with Model LRSW—it has the advantage of Mack's Balanced Bogie with exclusive Power Divider, enabling it to pull through where other trucks bog down. In actual service Model LRSW has demonstrated its ability to maintain the time schedule of smaller-capacity dumpers.

Why not investigate the big-unit economy of Mack Model LRSW. It will pay you to see these big jobs at work.

MACK TRUCKS Empire State Building, New York 1, N. Y.

(Advertisement)

2925

"Best Front End Loader This County Ever Had"

CALICHE BASE FOR A NEW ROAD in Bee County, Texas, is obtained from leased pit near Skidmore. INTERNATIONAL DROTT TD-9 Skid-Shovel loads out all the material needed for building and maintenance along county's 450 miles of roads, keeps four trucks busy hauling.

Bee County, Texas, cuts materials handling, excavating cost with INTERNATIONAL DROTT Skid-Shovel, according to County Commissioner H. F. Speikerman

Materials handling, sewer and gutter excavation, ditching and stockpiling start the long list of jobs handled by the INTERNATIONAL DROTT TD-9 Skid-Shovel owned by Bee County, Texas.

"There's just nothing that this Skid-Shovel can't do," according to County Commissioner H. F. Speikerman.

"Any type of loading work or any small excavating job is done much better, much faster and with much less expense by this unit.

"We saw all the tractor-mounted front-end loaders in operation but none of them could match the performance or the production of the INTERNATIONAL DROTT *TD-9 Skid-Shovel."*

Only with INTERNATIONAL DROTT Skid-Shovels do you get the benefit of Skid-Shoes which utilize the lever principle to provide 300% greater bucket break-out or digging force. Heaped loads are transported at ground level . . . and in high gear . . . on the Skid-Shoes, which take wear and carrying strain off the tractor.

The exclusive and patented Hydro-Spring absorbs 70% of the shocks normally encountered in front-end loaders, extends the life of the equipment, makes operating far easier.

INTERNATIONAL DROTT Skid-Shovels are available in four sizes. For the unit best suited to your job, call your International Industrial Power Distributor today.

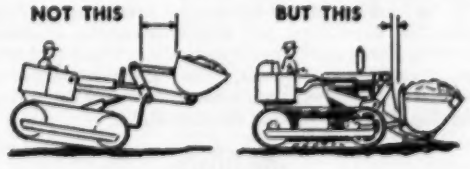
INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS
DROTT MANUFACTURING CORP., MILWAUKEE 8, WISCONSIN

PRY-ACTION BREAK-OUT

3,000 to 9,000 lbs., all on front of tractor

9,000 to 27,000 lbs., all on loader shoes on ground

SKID-SHOE TRANSPORTATION



INTERNATIONAL HARVESTER

INTERNATIONAL DROTT

16° below zero, but Wyoming road builders keep going—thanks to Du Pont "ZEREX" anti-freeze

In the Wind River Canyon, where the river cuts a winding gorge 4,000 feet deep through Wyoming's Owl Creek Mountains, Inland Construction Company's men and machines are battling winter snowstorms, temperatures 16° below zero, rocky frozen terrain. They're building a new stretch of state highway, and it must be completed by spring.

Meeting this deadline means keeping every piece of equipment—trucks, shovels, tractors, rock wagons—on the job every minute of the day despite the weather. "We've got more than 50 pieces going on this job," says Superintendent Dan Ratliff. "Some units cost more than $40,000. We can't afford a breakdown. One day lost would cost us plenty."

"We've tried lots of anti-freezes, but since using Du Pont 'Zerex,' we haven't lost any time with radiator troubles. Haven't suffered one cracked block. Haven't been bothered with clogged cooling systems, either. 'Zerex' has a special chemical rust inhibitor. There's no oily substance that makes rust cling to the thin tubes in the radiator."

"The weather's pretty rough up here; we need anti-freeze protection eight months out of the year. With Du Pont 'Zerex' we know we're safe. When you see how well 'Zerex' works with these heavy babies, is it any wonder I use it in my own car, too?" Order your "Zerex" now. Get it in 54-gallon drums for convenience and economy.

DU PONT
ZEREX
REG. U. S. PAT. OFF.
Anti-Rust ANTI-FREEZE

DU PONT
REG. U. S. PAT. OFF.
BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

E. I. DU PONT DE NEMOURS & CO. (INC.), WILMINGTON, DELAWARE

On-the-Job Contractor-Labor Relations

by LEON B. KROMER, JR.

National Joint Board Threatened

THE NATIONAL JOINT BOARD for the Settlement of Jurisdictional Disputes is confronted with its most critical test and, with it, the whole machinery for peaceful settlement of jurisdictional disputes in the construction industry. Oddly enough, it is one of the smaller international unions, the lathers, which is directly challenging the authority of the Joint Board to make work assignment decisions. The case arose when a lathers local refused to comply with a decision of the Joint Board in which an acoustical ceiling job was awarded to the carpenters. What lifts this dispute out of the ordinary is the fact that the lathers have a powerful ally in the plumbers, who have thrown their support to the lathers.

NLRB Now Has Case

The case is now out of the hands of the Joint Board and before the National Labor Relations Board for decision. Should NLRB decide in favor of the lathers, it could spell the end of the Joint Board. There would then remain only one place to take jurisdictional disputes—the NLRB itself. However, indications are that the Board may not rule that way. Only once before, in 1950, has the Board acted on a case closely parallel to this. A contractor challenged the Joint Board's authority to make work assignment decisions and took his case to NLRB. It held that as all parties to the dispute were signatories to the agreement setting up the Joint Board and had agreed to abide by its decisions, they must be bound now. More recently, Philip Ray Rodgers, a member of NLRB indicated at a contractors meeting that jurisdictional disputes should be handled by the Joint Board.

A reversal of the Joint Board's processes, through a decision favoring the lathers, would have serious repercussions throughout the industry. No one could forecast what would happen to a project confronted with a juris-

dictional dispute during the months necessary to process a case through NLRB.

Contractors Asked to Support Labor Law Changes

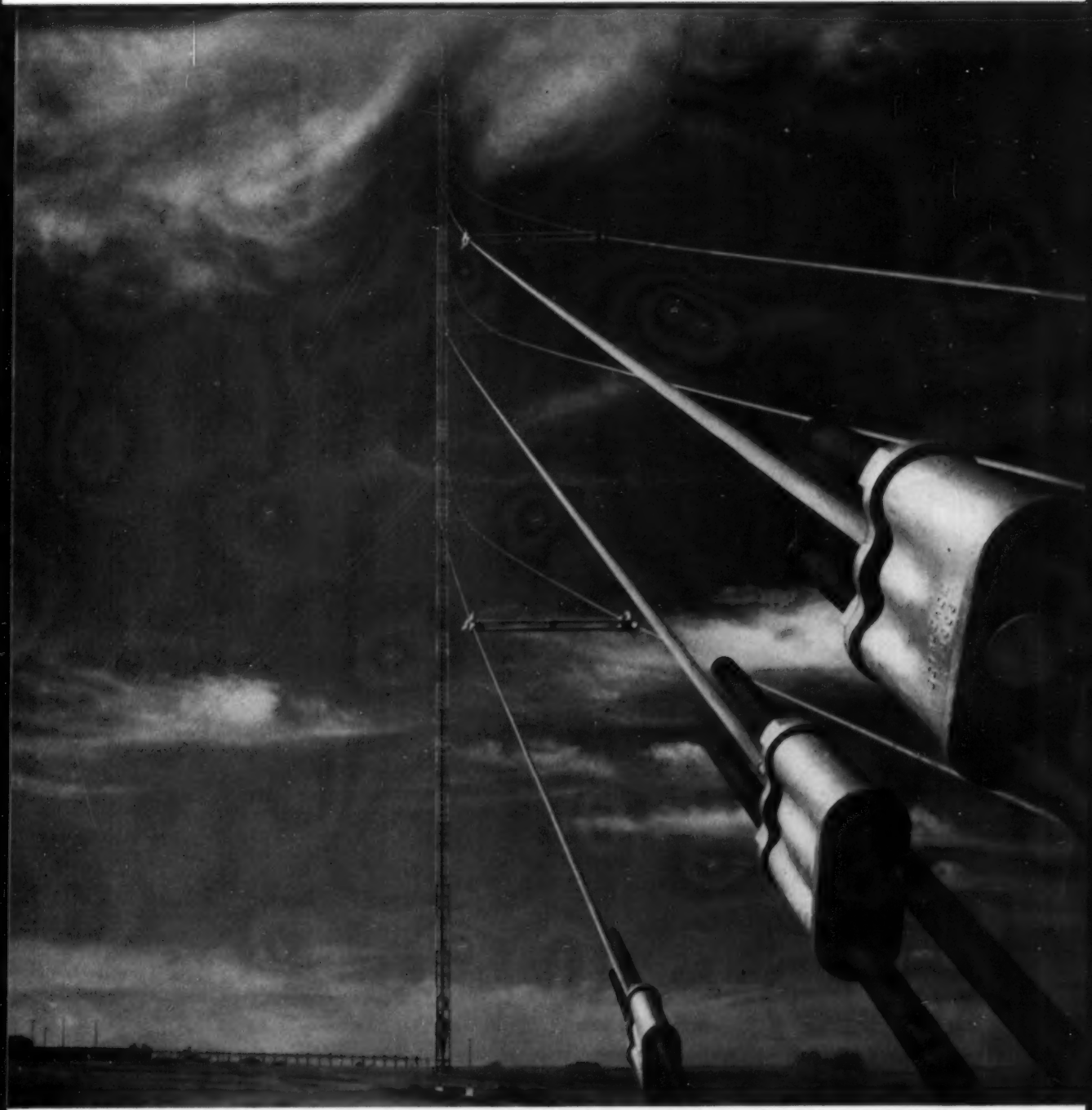
Local building trades officials are following through on the advice from Dick Gray, president of the Building Trades Department, AFL, in seeking active support from their contractors' associations for enactment of amendments to the Taft-Hartley and Davis-Bacon Acts. This is the first result of the huge building trades legislative conference held in Washington in March (CM&E, April p 174). The amendments are now before the labor committees of both the House and Senate. In the Senate the bills strongly backed by the unions are designated S. 1269 (to amend Taft-Hartley) and S. 1285 (to amend Davis-Bacon). In the House the companion bills are H.R. 4565 and H.R. 4566 respectively. A number of similar bills have been introduced in both houses by Democrats and Republicans, and all have been referred to the labor committees.

A Chance To Help

While no dates have been set for hearings, contractors organizations are, in some cases, wading through technical legislative language of the bills to try and find out what it is they are being asked to support. If certain proposed changes would benefit the industry as a whole, contractors have the moral responsibility to support them. It is also good labor relations to work with the unions when it is to the interest of both to do so. All too often contractors and unions get together only when disputes arise, or for purposes of negotiating collective agreements. Here is an opportunity to come together to discuss measures that can benefit the industry.

One contractors association missed this opportunity. When their committee sat down with the building trades council, which asked their support without much consideration of what was involved, the association turned down the whole thing without any explanations. Another association re-

(Continued on page 167)



Dresser-Ideco Co. designed and fabricated the steelwork for this greatest of the TV giants; Mizell Construction Co., Ganado, Tex., handled the erection.

Wire Rope at Work—The tallest structure ever built by man now pokes its spire through the Oklahoma clouds, rising like a giant steel needle from the surrounding plains. This is the television tower of Station KWTV, Oklahoma City—a landmark that measures 1572 ft from ground level to top.

So slim and graceful is the tower that, from a distance, it appears to be a delicate line penciled against the sky. Yet it weighs 1,323,392 lb—a vertical load that requires the sturdiest type of bracing. To guy the structure, the engineers employed 24 steel cables composed of Bethlehem strand, a member of the Bethlehem wire rope family. These tremendously strong guy lines, which range in diameter from 1½ to 2 in., have an aggregate weight of more than a hundred tons and a combined length of over five miles.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

CONSTRUCTION • MINING • PETROLEUM • EXCAVATING • QUARRYING • LOGGING • MANUFACTURING

This P&H 955-A LC — one of three operated by the Knickerbocker Construction Company — handles a 1-yd. concrete bucket on a 230′ boom at a 90′ radius.

It's the world's longest boom

. . . on a P&H 955-A LC

And there you are . . . 230 feet of boom! It's an all-time high for crawler cranes . . . 190′ of main boom with a 40′ jib. This machine is at work on a new apartment building in New York. It will pour concrete all the way to the top — 22 floors up. At the 15th floor level the crane is still able to reach the center section of floor, pouring direct without need for hoppers and concrete buggies. Think of the saving!

Here's why P&H was picked for this job. P&H all-welded construction provides the extra strength of rolled alloy steels, throughout. Lower center of gravity gives it extra stability for extra-long booms . . . lets you put more on the hook with less danger of tipping. And friction-free Magnetorque* assures super-smooth swings which protect the long boom against shock loading or snapping.

It will pay you to get facts about P&H advantages. See your P&H dealer. P&H Power Crane and Shovel Division, HARNISCHFEGER Corporation, Milwaukee 46, Wis.

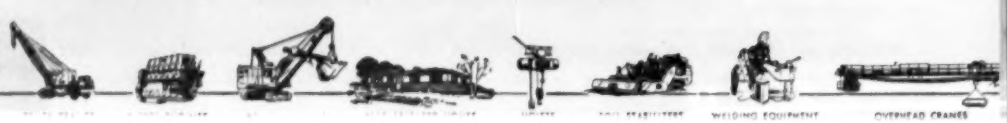
*T.M. of Harnischfeger Corporation for electro-magnetic type coupling.

See your P&H dealer

"Your P&H Dealer has the experience, the organization and the facilities to serve you reliably in every way. He's ready to deliver the kind of on-the-ground service that keeps your jobs moving on schedule. Your P&H Dealer is tops in the business. Get to know him."

HARNISCHFEGER

the P&H Line



LABOR . . . Continued from page 164

fused to support any of the amendments because one of the sponsors is a member of one of the building trades unions. This group apparently was ignorant of the fact that some of the amendments contained in his bill were proposed by Senator Taft in 1951!

Another association, after meeting with the council, obtained copies of the bills and seriously analyzed them. They got expert advice and decided to support some, but not all, of the changes proposed.

Specifically, here is what they did. On Taft-Hartley they supported a new subsection (e) to follow Section 8 (d) that would permit negotiation of the so-called "prehire" agreement common to the construction industry. It would also reduce from 30 to 7 days the time in which an employee decides whether or not to join the union. They said, "To realistically recognize the employment conditions of the industry, the time in which an employee should decide whether or not to join a union should be reduced to 7 days."

Group Supports Changes

Although this association happens to be in a state with no "right-to-work" laws, nonetheless its members came out for repeal of Section 14 (b) of the Act. In writing to their senators they stated, "As a matter of principle, a federal statute should not by its own terms negate a portion of its own provisions in favor of state laws that have more stringent provisions covering the same subject. In the present case, the Taft-Hartley Act seeks to establish certain legal responsibilities of employers and the representatives of their employees and define a code of conduct for both to eliminate obstructions to interstate commerce. Yet, under 14 (b), the rules are changed, so to speak, for those industries engaged in interstate commerce if they happen to be in states with "right-to-work" laws. This does not seem consistent with the main purposes of the Act. . . . In our opinion, it is not consistent with the basic concept of the supremacy of federal over state statutes."

The association came out against any change in the present secondary boycott provisions and any relaxation of the mandatory injunction in certain unfair labor practice cases.

The association supported revi-

sions in the Davis-Bacon Act to require payment of at least time and one-half for all hours worked after eight in one day and forty in one week. (This is actually an amendment to the Eight Hour Law but contained in a bill to amend the Davis-Bacon Act.) They did not support the further changes that would require premium pay for all time worked on Saturdays, Sundays and holidays as such. They rejected the proviso that would require the Secretary of Labor to stipulate other payments contractors and subcontractors would have to make. This revision is intended to cover such payments as travel expenses, board, lodging, contributions to welfare, pension and vacation funds. On this the contractors stated, "This amendment would have the effect of having the federal government require and force any contractor bidding upon its work or work financed by a federal agency to comply with provisions of collective agreements even though they were never parties to the agreements and did not intend to become such. This goes beyond the intent of the Act and should not form a part of a minimum wage law."

For Better Enforcement

To bring about uniformity of enforcement, this group favored placing major enforcement authority with the Secretary of Labor. Under present law the various contracting agencies are responsible for compliance by their contractors. The Secretary of Labor has no enforcement authority at all.

In writing to their representatives in Congress the association also sent copies of the letters to the head of their local building trades council. Union members privately agreed that they could not expect their contractors necessarily to support all the amendments, but openly expressed satisfaction that the association had taken steps to support some of them actively. It has since resulted in much closer cooperation on other problems affecting local labor relations and better understanding between the contractors and unions.

COMING . . . in July
Equipment-Maintenance
Directory

9:40 AM — A Caterpillar D-7 is ready for its daily grease job and maintenance check. Hoses reach from the Portable Service Station. Fresh, clean lubricant is applied with finger-tip control. Time: 12 minutes.

9:53 AM — This LeTourneau Carry-All is serviced fast. Major bearings, vital lubrication points, all serviced and ready to go in just 7 minutes. With NO time lost in traveling to and from a central grease shop!

10:01 AM — The operator is seen filling crankcase to proper level on this Motor Grader. Meter shows exact amount of oil pumped—no waste. This equipment is greased and checked in only 22 minutes!

Beat "impossible" time schedules,

lick the toughest lubrication maintenance problems!

Triangle Construction depends on Alemite "on-the-go" lubrication to protect vital rigs!

Faced with the problem of meeting almost impossible schedules on job after job involving heavy earthmoving equipment, the Triangle Construction Company of Kankakee, Illinois, consulted their Alemite suppliers, the General Equipment Company. On their recommendation this Alemite Portable Service Station was assembled.

Standard Alemite equipment was mounted on a 2½-ton truck. Thus, the service station went right to the equipment. Results were immediate and impressive! First saving was in time. Rigs paused only momentarily for service and routine maintenance, and time waste in going to and from the grease shop was completely eliminated.

Even more important was the saving in equipment downtime which became apparent with proper, regular lubrication-protection. There was less machine wear and maintenance costs dropped sharply.

Your Alemite representative can "tailor" a portable service station to exactly fit your needs. Show you how you too can save these three ways!

1. Save Time! By bringing complete power lubrication right to the equipment on the job – safely, efficiently!

2. Save Money! By cutting expensive lubrication downtime – increasing output of both men and machines!

3. Save Equipment! By greatly reducing the possibility of costly, time-consuming bearing failure and excessive wear!

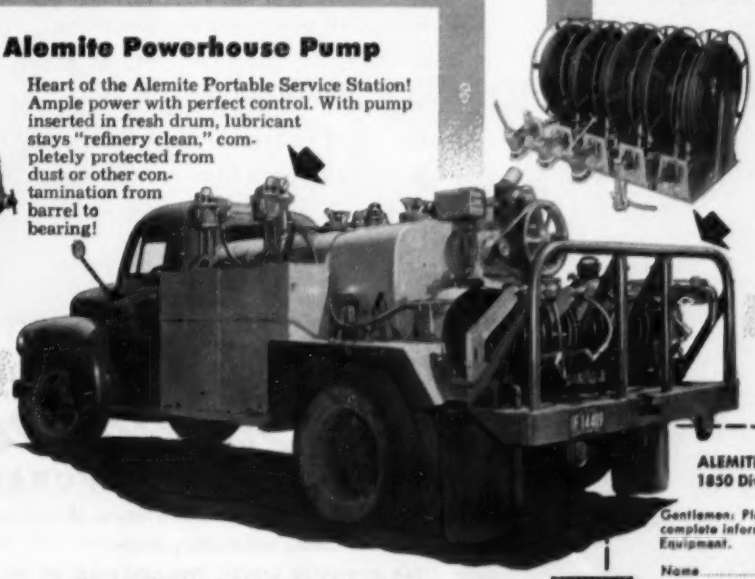
The Alemite Powerhouse Pump

Heart of the Alemite Portable Service Station! Ample power with perfect control. With pump inserted in fresh drum, lubricant stays "refinery clean," completely protected from dust or other contamination from barrel to bearing!

Alemite Automatic Hose Reels

Mounted directly on the truck bed, these hose reels allow the operator 40' of hose, provide positive delivery. No tension while applying lubrication, yet hose automatically retracts when finished. Keeps hose off the ground, out of the way. Manual models also available. Reels offer these 4 services:

1. Fast, easy greasing of track rolls, fittings.
2. Quick filling of gear housings, transmissions, final drives.
3. Delivers exact amount of crankcase oil needed—no waste.
4. Air line for inflating tires or air cleaning.



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Gentlemen: Please send me your FREE illustrated booklet containing complete information on Alemite Portable Service Stations and Alemite Equipment.

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ALEMITE
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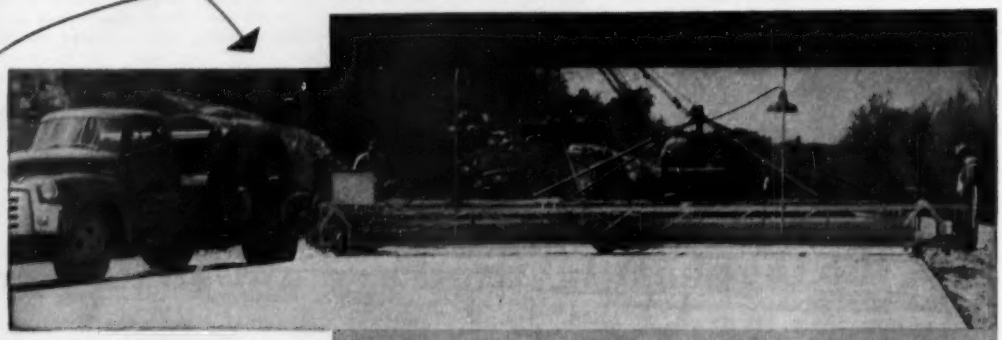
A PRODUCT OF SW STEWART-WARNER

WORLD'S LARGEST CONCRETE ROAD CUTTING JOB PROVES SUPERIORITY OF *CARDINAL BLADES!*

1,000,000 feet of West Virginia turnpike cut in record time—at lowest cost in history!



In cooperative effort with William F. Middlestadt of Seals, Inc., of Baltimore, who furnished equipment and personnel, CARDINAL NON-BRAK BLADES cut a 68 mile x 1½ inch longitudinal joint in this new two lane highway, and a 24 foot transverse joint every 18 feet . . . total—1,000,000 lineal feet through limestone aggregate. Job completed with CARDINAL NON-BRAK BLADES in record time at a record low cost.

When you work with CARDINAL, you work with blade men who know the concrete cutting business . . . men who will frankly tell you when a rugged, low-cost CARDINAL NON-BRAK BLADE will do the job on green concrete, at less cost than a diamond blade . . . or, when a CARDINAL DIAMOND BLADE will give you the best deal, cost-wise, on aged concrete or other hard specifications. More footage per day . . . less cost per cut—that's the kind of guarantee that makes good sense. Call, write or wire, today!

Cardinal

ENGINEERING CORPORATION

World's Largest Exclusive Manufacturer of Concrete Cutting and Masonry Blades

144 BURNSIDE STREET, PHILADELPHIA 27, PA., U. S. A

Branches or Distributors in Most Principal Cities

High-speed traffic barrels past work areas as . . .

Scrapers Steal Show on Turnpike Widening

FLEETS OF SCRAPERS are doing a fast job of reworking 55 mi of slopes on the New Jersey Turnpike. Operating only a few feet away from high-speed traffic, they are quickly building the grade for an additional lane in each direction. Dirt is flying along the entire stretch from Camden to Woodbridge, and except at the borrow pits, there isn't a power shovel on the job.

Although the topography along the stretch is the rolling-hill type all the way, the three contractors handling the work differ considerably in their choice of rigs. The job is strictly for scrapers, but there are all sizes and shapes in use. Models range from fast, maneuverable D Tournapulls with 7-yd bowls to powerful twin-engined Euclids carrying 25 yd.

BARRIER CURB with wire-rope railing keeps men and equipment away from high-speed traffic. Flashing light, Scotchlite reflective squares, and rubber cones warn motorists.

At the southern end of the job near Camden, S. J. Groves & Sons, of Woodbridge, N. J., has a fleet of 14 scrapers, seven small and seven large. The small ones are Le Tourneau D's and Euclid S-7's. Both carry a heaped load of about 9 yd. Their small turning radii make them highly maneuverable even in the tight areas between shoulders and adjacent steep slopes. Groves' large scrapers are seven new Caterpillar DW21's. These 20-yd units are best suited for the more open-type cuts and fills.

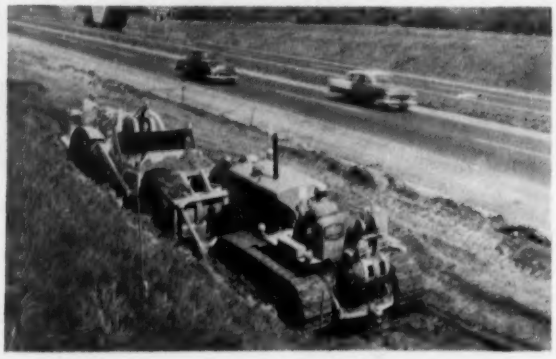
To concentrate equipment spreads, Groves started at the north end of the southbound lane and is now advancing south. At the southern end of the job, the contractor jumped across to the opposite lane, and works north. The length of the job is 16 mi.

Just north of Groves' job, Reid

ALLIS-CHALMERS SCRAPER pushed by HD20 tractor excavates next to existing shoulder as traffic speeds a few feet away.

LETOURNEAU-WESTINGHOUSE D Tournapull makes fast U-turn in narrow area between Turnpike travel lanes and steep slope.

EUCLID S-7 SCRAPER pushed by Caterpillar D8 tractor is quickly heaped with 9 yd of earth from drainage area near steep slope.



Small scrapers are well suited for excavating in tight areas like this. New model is powered by 143-hp diesel engine.

CATERPILLAR No. 21 pulled by DW21 tractor spreads load over shelf to widen embankment. To build up a fill, angle dozers

first cut shelf in old slope. Cycle of scrapers spread lift, rubber-tired roller follows, and then operation is repeated.

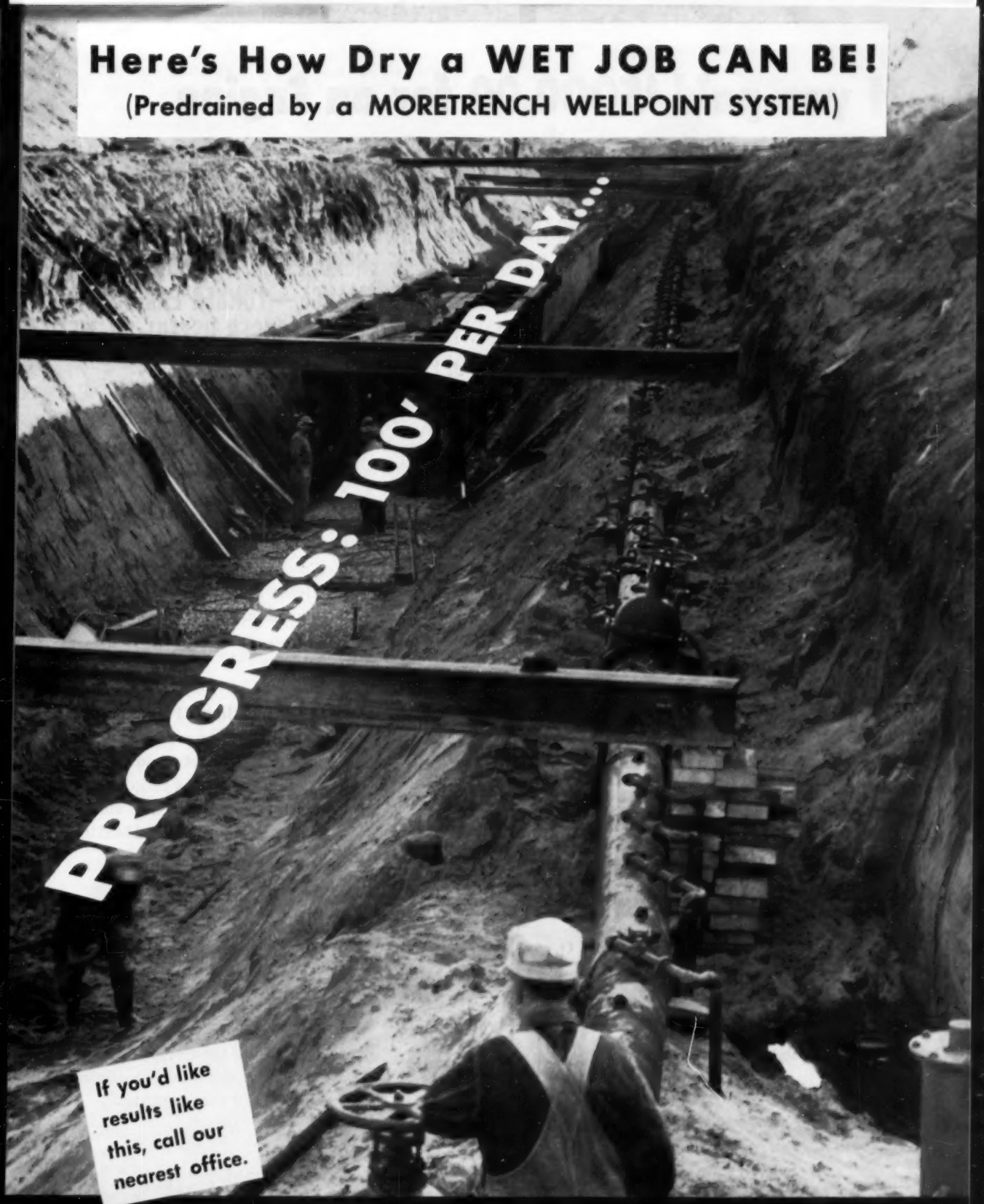
Contracting Co., also of Woodbridge, brought in a fleet of Allis-Chalmers scrapers to work a 22-mi section of the Turnpike. Most of the rigs are 13-yd TS200's and 18-yd TS300's. Like Groves, Reid uses the smaller rigs where maneuverability is important.

The third widening section, near New Brunswick, is 17 mi long and is being done by Savin Construction Corp. of East Hartford, Conn. Savin prefers all big scrapers. His twin-engined Euclids can't turn on a dime, but they carry 25 yd of material, and their big tires help them maneuver through deep sand.

Scraper operations consist mostly of stripping and stockpiling topsoil, undercutting unsuitable material below the existing shoulders, excavating suitable fill in widened cuts, and constructing embankments. *(Continued on page 175)*

Here's How Dry a WET JOB CAN BE!

(Predrained by a MORETRENCH WELLPOINT SYSTEM)



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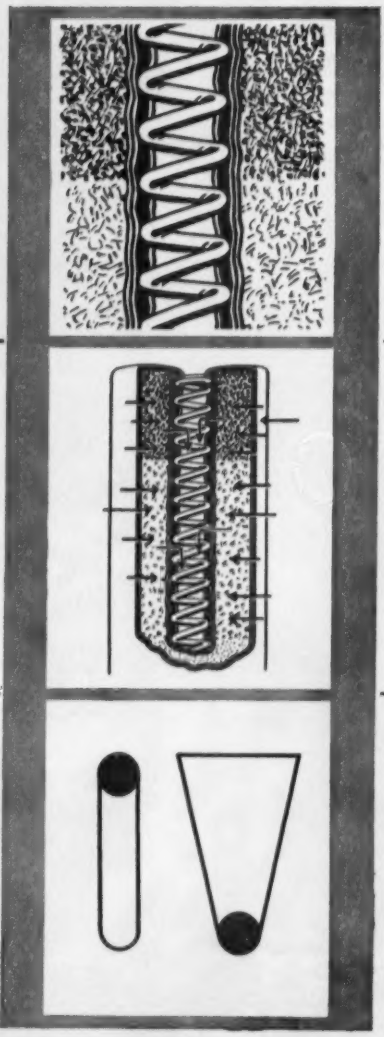
If you paid $5000.00 for an Engine would you protect it with a 79¢ Filter??

Thirty years of product development have made Winslow filters best for your engines...continuing research insures constant improvement in materials and performance.

BARGAIN HUNTING FOR FILTERS JUST DOESN'T MAKE SENSE, REGARDLESS OF ENGINE PRICE. THE ONLY BARGAIN YOU CAN BUY IS PERFORMANCE—LONGER ENGINE LIFE, REDUCED MAINTENANCE COST, LONGER USEFUL OIL LIFE AND GREATER OPERATING EFFICIENCY.

THE PROBLEM

Complete engine protection at all times, filtering all the lube oil under either hot or cold oil conditions.



WINSLOW'S ANSWER

The Winslow CP* (Controlled Pressure) design which permits use of a dense filtering media and a section of less dense filtering media within a single element. Cold oil is filtered through the less dense media which removes all dangerous particles from the oil.

An element with definite and predictable flow and pressure characteristics for various engine applications and requirements.

In a Winslow CP* element the ratio of filter materials determines the rate of oil flow through the element. This ratio is set for each size and type CP* element, based on laboratory and field tests.

An element that does not permit surface clogging with consequent reduction of efficiency and dirt holding capacity.

The CP* design of progressive filtration. A "V" shaped arrangement of the filtering media which traps smaller and smaller particles as the oil progresses toward the core of the element. This construction increases the efficiency and life of the element.

. . . . positive evidence that Winslow filters are your best bargain in complete engine protection regardless of original cost ! ! !

WINSLOW FILTERS **CP is fully protected by patents and trademarks*

55-A-1 **Winslow Engineering Company** 4069 Hollis Street • Oakland 8, California

TURNPIKE WIDENING ... Continued from page 172

Where possible, high banks in cut sections are not being touched, to preserve the protective vegetation. Instead, new drainage areas will be built to conform with the existing banks. In areas where erosion has taken place, or where the degree of slope could start new erosion, concrete pipe is being laid to carry off the drainage.

Steep slopes that have to be widened are first stripped with dozers. The underlying material is then pushed down to the base of the slope and carried away with scrapers. Gentle slopes can be stripped and graded entirely by scrapers.

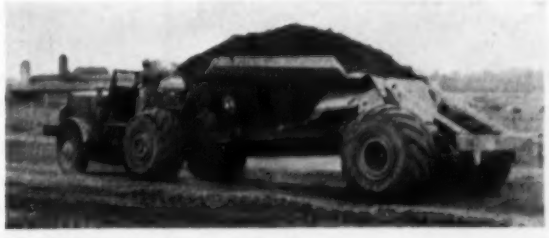
To widen an embankment with scrapers, an angle dozer first cuts a shelf into the slope to give the scrapers a safe road to ride on and also to key the new fill into the old. Scrapers then make several passes over the shelf, spreading material they have picked up in a cut or a borrow pit. After a cycle of scrapers has covered the shelf with a layer of fill, the angle dozer makes another pass to extend the shelf. A pneumatic-tired roller follows to compact the lift. This procedure is repeated until the embankment is widened to its full height.

Borrow excavation is another big item on the job. Earth and select borrow on the 55-mi stretch totals nearly 1½ million yd. It is mostly a shovel-and-truck operation. Big 10-wheel dump trucks are loaded at a number of borrow

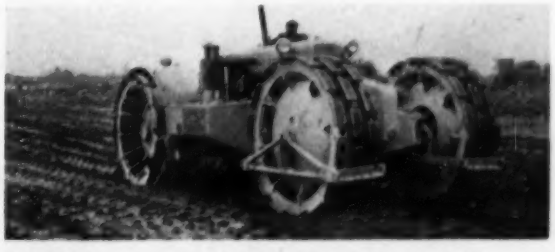
EUCLID LOADER SPREAD moves up to 1,200 cu yd per hr with fleet of nine 25-yd Euclid bottom-dump wagons. Haul is about 1,500 ft. Fill goes into network of huge interchange ramps.

HIGH-CAPACITY RIG is pushed and pulled by Caterpillar D8 tractors. Signalman beckons driver to move loaded wagon ahead. When pit is wet, HD15 tractor keeps wagons moving.

PLOW-TYPE CUTTING EDGE bites into 3-ft bank as conveyor quickly picks up earth chunks. Spread follows circular pattern in pit.

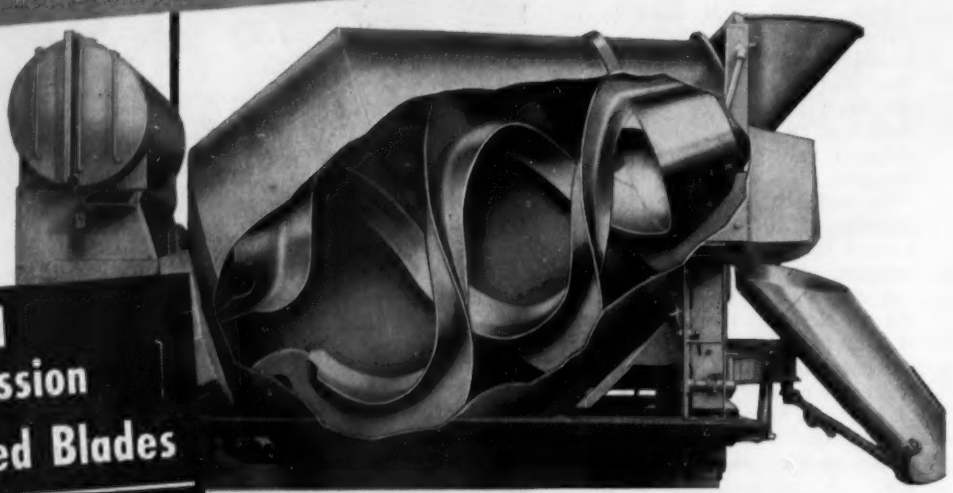


BIG 25-YD WAGON hauls fill short distance and dumps in ramp area. C. J. Langenfelder & Sons is contractor.



HEAVY FILL at new interchange for Pennsylvania Turnpike connection is rolled with self-propelled Buffalo-Springfield Kompactor.

SMITH
DE LUXE TRUCK MIXERS



Cutaway view of the Smith De Luxe Truck Mixer drum. Note the patented "T"-shaped blades — the greatest improvement in mixing action ever put into a truck mixer drum.

2-Speed Transmission
+ T-Shaped Blades
= Better Mixed Concrete

Want Quality Concrete... in a Hurry?

If you do, the Smith "concrete factory" with the PATENTED "T" SHAPED BLADES and 2-speed transmission, is your answer. In any inclined axis drum the heavy rock naturally rolls to the lowest point, and the fines will float. Smith has the *only* blade which counteracts this segregation. The mix is pulled to the big end of the drum, picked up, turned over, and poured into the center of the batch. True flow action takes place.

The 2-speed transmissions, standard on Smith mixers, give you the complete range of drum speeds needed regardless of the length of haul. You never need to undermix or overmix in a Smith . . . you have complete control.

The proof is in the concrete which you discharge from your Smith . . . the last shovelful out of the drum is exactly the same as the first shovelful. Call or write your nearby Smith dealer for complete details.

The T. L. SMITH CO., 2851 N. 32nd St., Milwaukee 10, Wis. U. S. A.
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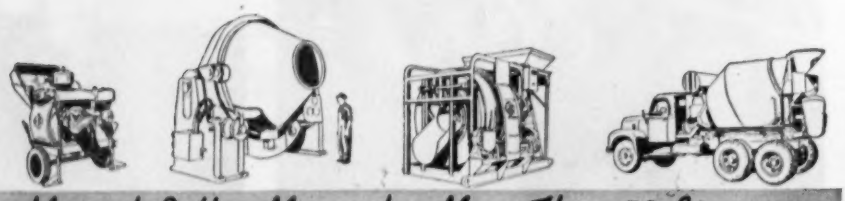
SMITH
THE T. L. SMITH CO. MILWAUKEE

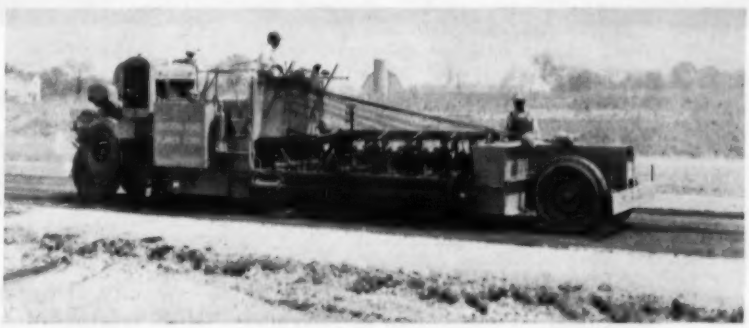


Builders of Better Mixers for More Than 50 Years

pits spotted all along the job. They ride on access roads as much as possible, to keep away from the high-speed Turnpike traffic. If they must use the travel lanes, they are required to move at least 30 mph. After the trucks dump, the material is spread with graders and dozers and compacted by sheepsfoot or rubber-tired rollers.

When the grading work nears completion this summer, the contractors will roll the old shoulder material to one side and box out an 18½-in. deep 13-ft wide section along the edge of the existing outside travel lane. This will be built up with 6½ in. of selected subbase, 7½ in. of penetration macadam, and 4½ in. of bituminous concrete surface. Macadam will be placed in one 4- and one 3½-in. course, while the bituminous concrete will be laid in three 1½-in. courses. The edge of the new surface will be joined tightly to the old at a 1½-in. deep notch sawed out of the old pavement. The new 12-ft shoulder will be 3 in. of penetration macadam on 7 in. of old shoulder material blended with crushed stone.

BORROW EXCAVATION in one of Reid Contracting Co.'s pits is handled by Bucyrus-Erie 51-B shovel and fleet of International dump trucks. Pits are spotted along job.



ROAD PLANING MACHINE shaves high pavement bumps to prepare Turnpike for resurfacing. Universal rig also makes tapered cut for smooth transition with old surface.

Traffic Protection

Traffic protection alone on the widening job is costing more than $1,000,000. In fact, one contractor's lump-sum item for traffic protection is $360,000. Working along a

(Continued on page 180)

MUD-JACKING HOSE is placed in drilled hole of settled concrete approach slab. Grout is then pumped in to lift it.

UNDERPASS WIDENING is required all along job to support third lane. Workmen on scaffold demolish section of old bridge.

Allis-Chalmers TS-360 Motor Scrapers are key machines

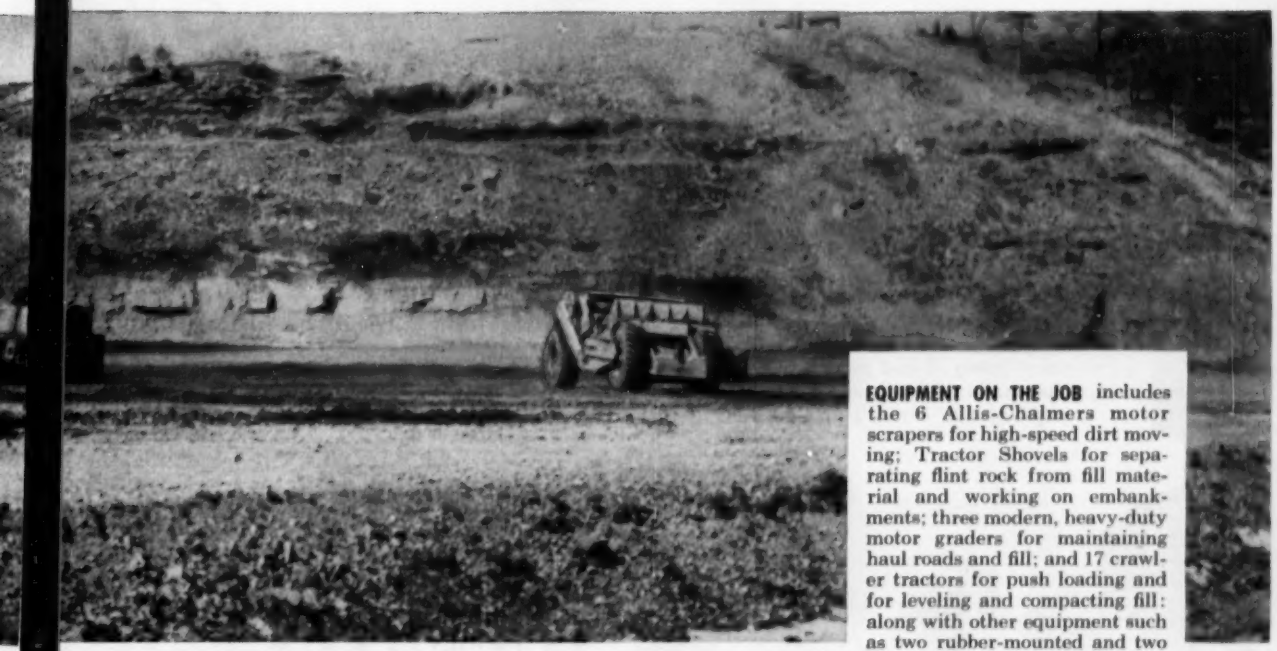
RUSHING MISSOURI DAM

QUICK JOB FACTS

Scheduled for completion in November, Fellows Lake Dam will impound up to 9 billion gallons of water to feed McDaniels Lake, the main reservoir to supply water for the city of Springfield, Missouri. M. E. Gillioz, contractor, Monett, Missouri, will move a total of 1,750,000 cu yd for the rolled earth-fill dam. It will be 2,870 ft long, 100 ft high, 600 ft wide at the base and 20 ft at the top.

1. SCRAPERS LOAD IN 30 SECONDS with the help of torque converter tractors. Even in material containing tough flint rock, the 280-hp TS-360's get big, 20-yd loads and are on the way in a hurry from borrow pit to fill.

2. FAST, EVEN DUMPS are attained through positive forced ejection and exclusive high apron lift (102 in.). High rim pulls enable the motor scrapers to dump on-the-go and cut valuable seconds from cycle time.



EQUIPMENT ON THE JOB includes the 6 Allis-Chalmers motor scrapers for high-speed dirt moving; Tractor Shovels for separating flint rock from fill material and working on embankments; three modern, heavy-duty motor graders for maintaining haul roads and fill; and 17 crawler tractors for push loading and for leveling and compacting fill: along with other equipment such as two rubber-mounted and two crawler-mounted cranes. The tractors, Tractor Shovels and three motor graders are also Allis-Chalmers units—Gillioz has been a user of Allis-Chalmers equipment for more than 20 years.

TO COMPLETION

3. 6,000-FT CYCLES IN 4.4 TO 5.1 MIN. Averaging 118 trips per 10-hr day (11¾ per hour), each motor scraper moves about 188 *pay* yd per hour — 1,880 per day. Loaded scrapers are accelerating up to speeds of 20 mph within 300 to 400 ft. Good haul roads maintained with Allis-Chalmers motor graders contribute to fast haul cycles. Graders are also used on the fill.

4. TRACTOR SHOVELS HANDLE VARIETY OF WORK. Gillioz' Tractor Shovels are equipped with rock buckets for separating oversize rock from fill, cutting embankments and other work. Fenix and Scisson, Tulsa, Okla., also used Allis-Chalmers Tractor Shovels for excavating and loading on the 808-ft, 8-ft-high diversion tunnel to the reservoir.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

TURNPIKE WIDENING . . .

Continued from page 177

heavily traveled limited access highway requires extreme precautions. Besides an army of uniformed guards and signalmen, it calls for a huge quantity of signs, lights, flares, barricades, barrier curbs, reflective markers, and rubber cones.

Work has to be planned so that two-lane traffic on existing travel lanes is maintained in each direction from Friday noon to Monday noon, the period of peak traffic, and no equipment may use travel lanes during this period. Work may be done within 12 ft of a travel lane only if a timber barrier curb is erected. During the week, one-lane traffic is permitted for short periods, if adequate warning signs are set in place.

Can't Cross Median

Contractor personnel, vehicles, and equipment are never allowed to cross over the median strip. To make a U-turn, a vehicle must drive to the nearest overpass, enter the contractor's access-road gate in the right-of-way fence, cross over the bridge, and re-enter the Turnpike through another gate. Only authorized personnel have keys to open the gates.

The number of men assigned exclusively to traffic protection is high. Besides the uniformed guards and their foremen, a number of crews keep busy maintaining, moving, and erecting protective devices. Cones and reflective markers must be moved ahead as equipment spreads advance.

Although grading and paving are the two big items on the job, several other operations have to be carried out at the proper time to prevent bottlenecks. Many of the underpasses and culverts, for instance, must be widened on each side. And because crews are not allowed to cross the median strip, many of these jobs have to be worked independently on each side.

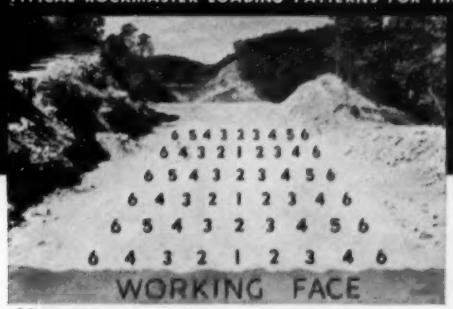
Another tricky operation is mudjacking. Many of the approach slabs at the underpasses have settled and have to be lifted back in place. During this operation, traffic is slowed and restricted to one lane.

Heavy traffic has also taken its toll of pavement. Many areas, especially in Reid's section, require planing and resurfacing. This work is also hazardous because of one-

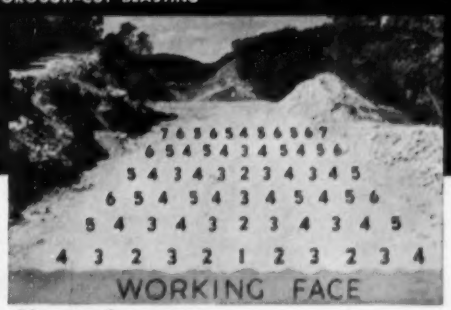
(Continued on page 183)

Piled right for easy digging ...with ROCKMASTER®

TYPICAL ROCKMASTER LOADING PATTERNS FOR THOROUGH-CUT BLASTING



Alternate



Alternate Progressive

This is the kind of breakage and displacement that means economical handling for the contractor. With the ROCKMASTER Blasting System, close control over throw and maximum breakage was obtained by Condon-Cunningham Co. and Peter Kiewit Sons Co., contractors for part of the new West Virginia Turnpike.

The diagrams above show typical ROCKMASTER loading patterns for thorough-cut blasting. The holes are loaded with the earliest delays in the center with successive delays located progressively to the edges of the cut. As the blast is fired, the first delays give relief to the following holes and movement of the burden is toward the center of the blast area. You can see it in the second photograph . . . movement is in, not out. And the breakage was so thorough this pile was "panned" out.

For results like this, put ROCKMASTER to work on *your* blasting problems . . . it is the way to better breakage, easier handling. Get complete information on ROCKMASTER by writing for your copy of the new Atlas Explosives Catalog.

ATLAS

ATLAS EXPLOSIVES

"Everything for Blasting"

ATLAS POWDER COMPANY,
WILMINGTON 99, DELAWARE

Offices in principal cities

TURNPIKE WIDENING . . .

Continued from page 180

lane operation next to fast traffic.

In addition to the 55-mi stretch in the central part of the state, described above, there are two other widening areas. Union Building and Construction Corp. of Passaic, N. J. has a 6-mi. section at the northern terminus of the Turnpike. This stretch is built mostly on meadow, and requires a period of fill stabilization before any paving is done. The other piece of widening is south of Trenton at the Pennsylvania Turnpike interchange, now under construction. C. J. Langenfelder & Son, of Baltimore, has the contract. The contractor is doing the job mostly with International scrapers and a Euclid-loader spread.

E. Oak is project manager for S. J. Groves & Sons Co. G. Lancaster is project manager for Reid Construction Co., and J. Donovan is project manager for Savin Construction Corp. For the New Jersey Turnpike Authority, H. Goldberger is construction engineer and C. Noble is chief engineer. Consulting engineers are DeLeuw, Cather & Brill.

SAFE BLASTING . . .

Continued from page 150

not only to protect the contractor from liability claims, but also to establish good public relations throughout the area. The consideration which the contractor thus shows to occupants and their property can go a long way to pacifying the public's general annoyance with construction and blasting operations as a whole—and thus check their readiness to blame contractors without reason.

Such apparently elaborate preparations and tests may seem to some contractors not worth the time and effort expended; but DeFelice says they pay off not only on the job under way but also on future operations as well. By cooperation with Liberty Mutual to maintain a good safety record, DeFelice gets bottom rates for his insurance coverage. And this saving, he says, can be the margin which wins or loses the next contract.

COMING . . . in July
Equipment-Maintenance Directory

Loading trucks on a river diversion job in the French Camaroons. Dependability of equipment is important in remote areas. Eimcos have been selected where the going is tough.

Convenient, easy controls make the Eimco the easiest tractor to operate. There are no clutch pedals on the Eimco. It can be shifted up or down, forward or reverse at full speed.

The Master Mechanic says the Eimco is the only machine that stays put — he calls it "Old Durable."

Loading into 21 yard wagons on highway cleanup job. The 105 can do these jobs without blocking traffic.

An Eimco Tractor with excavating attachment loading large rocks for rip-rap.

Juggling big rocks into position can be done much more efficiently when the operator can see what is going on in front of the blade. This he can do with his Eimco Tractor.

LIGHT, RUGGED AMSCO® DIPPERS deliver more loads per shift

The all-cast Amsco dipper is made of the toughest steel known . . . manganese steel. Amsco dippers withstand rough handling, sharp impact and grating abrasion because of this same sturdy construction. And all dipper segments are plug-welded together, adding strength without increasing weight.

Notice the raked design . . . those sharp, fanned teeth bite out a capacity load every time. Dumping is instantaneous, because the dipper bottom has a larger opening than its top. And there are no snagging edges or cavities on the interior to collect clods and lower loading capacity.

Specify these light, rugged, Amsco dippers to get more bite and higher loading into the working end of your dipper sticks. You'll get more digging done in less time at no increase in power load. Specify Amsco manganese steel, too, for other parts that must be *extra tough*.

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Ill.

SALES AND ★ SERVICE ★

News of manufacturers' activities designed to assist the reader in the purchase of machinery, equipment and materials and help him obtain quick service on parts and maintenance.

Distributor Appointments

The Galion Allsteel Body Co: Announces the appointment of Acme Spring & Equipment Co., Charleston, as distributors of Galion Allsteel products in central West Virginia.

Chesflex Corp: A. H. Deveney & Co., Inc., Birmingham, Ala., has been appointed sole sales representative in the South and Southwest for Chesflex plastic pipe and fittings. Announcement is also made of the appointment of Theodore L. Smith, Baltimore, Md., as sales representative in Maryland, Virginia, District of Columbia and Delaware (with the exception of the Wilmington area).

Euclid Div., General Motors Corp.: Has announced the appointment of Mitchell Distributing Co. as authorized dealer for North Carolina for the complete Euclid line of scrapers, rear- and bottom-dump hauling equipment, the "Euc" loader, and the new TC-12 Twin-Crawler tractor. Ray Long Equipment, Inc. is now the authorized dealer for the Euclid products in South Carolina.

Buffalo-Springfield Roller Co.: The Reid-Holcomb Co., Indianapolis, has been appointed distributor for the company's complete line of roadroller and compaction equipment.

Earth Equipment Corp.: Has announced the appointment of the following new distributors to handle the company's Everett trencher: Hill and Yancey, Inc., Atlanta, Ga. in northwest Georgia; Modern Equipment Co., Jacksonville, Fla., in Florida and Southeast; Carolina Ford Tractor Co., Charlotte, N. C., in North and South Carolina.

Joy Manufacturing Co.: Has appointed Equipment & Supplies, Inc., Pittsburgh, as distributor of Joy construction equipment for southwestern Pennsylvania, and parts of New York, Ohio, West Virginia, and Maryland.

Cooper Alloy Corp.: The Cameron & Barkley Co. is now an authorized distributor of this company's stainless steel valves, fittings and accessories. The new distributor's headquarters are in Charleston, S. C., with branches in Savannah, Ga., and Jacksonville, Miami, Tampa and Orlando, Fla.

SALES AND SERVICE . . .

Continued

Hensley Equipment Co.: Keremi Tractor & Equipment Co. has been appointed exclusive dealer for this company's line of dozer and scraper rippers, bottom track rollers, cutting edges, scarifier parts and rippers and allied lines in the states of Wyoming and western Nebraska. Other dealers appointed are: Western Traction Co., Sacramento, Calif.; Pacific Hoist & Derrick Co., Seattle, Wash.; General Machinery Corp., Atlanta, Ga.; Columbia Equipment, Ltd., Vancouver, B. C.

Rapidex Corp.: The Baltimore Concrete Plank Corp., Baltimore, Md., has signed a license to manufacture and sell Rapidex, a lightweight concrete sectional slab system for floors and roofs, according to the announcement made by Carl F. Spickelmier, president of the Indianapolis concern.

Olin Mathieson Chemical Corp.: The Ramset Division has announced the appointment of Jackson Tool Supply Co. to handle the Ramset powder-actuated tool in northeast Ohio.

On the Sales Front

The Jaeger Machine Co.: Promotion of A. C. (Andy) Thomas from Truck Mixer Division sales manager to assistant general sales manager, has been announced. Emil L. Baugh, of Albany, Ga., has been appointed to succeed Thomas as sales manager of the Truck Mixer Division at Columbus. R. E. (Dick) Fowler will succeed Baugh as southeastern representative.

Cummins Engine Co., Inc.: Paul J. Every has been named assistant general sales manager. He has been associated with Cummins since 1947 and for the last 2 yr has been responsible for the world-wide activities of Cummins Diesel Export Corp.

American Chain & Cable Co.: Announcement has been made of the appointment of G. J. Helfrich as district sales manager for the newly established Detroit office of the R-P&C Valve Division with headquarters in Detroit. Replacing Mr. Helfrich as district sales manager in the Chicago area will be E. A. Antonelli whose office will be in Chicago. Mr. Antonelli's replacement as district sales manager in the Atlanta area will be J. W. Swanagon with headquarters in Georgia.

Harnischfeger Corp.: Announces the appointment of Gerald T. Raubach as assistant sales manager of the P&H Electric Shovel Division. Since 1952 he has been assistant manager of the service department.

TIME works for you—2 ways—with a GRADALL® on the job!

A full day's work... every day of the year

MORE ON-THE-JOB TIME! Gradall owners keep their Gradalls busy more hours each week—in all kinds of weather—all year long. Owners consistently report 2,000 and more working hours for Gradalls every year. A Gradall can handle jobs no other machine can touch, and complete them *fast*. Gradall speeds work whether it's doing the "big" job, or the costly "hand clean-up" work that often slows completion.

SLASHES DOWNTIME! Operating records of Gradall owners prove that the very minimum of time and cost is required for repairs and maintenance. It's designed for quick, easy maintenance. And because a Gradall can handle so many jobs, it is seldom idle. From one job, it's ready to speed to the next at highway speeds—no time is lost loading and unloading for transit. It carries its own attachments that can be interchanged for any job in less than 5 minutes!

If time is costing you *too* much money on your jobs, put a Gradall to work. It will make every hour a more profitable one with *more work* at *lower cost*. Arrange a field demonstration on your job with your Gradall Distributor.

Gradall digs its way through wet, sticky clay in building Texas canal.

GRADALL SPEEDS WORK, CUTS COST ON...

- Hand finishing and clean-up
- Excavating and loading
- Trenching and backfilling
- Snow and ice removal
- Ditch digging and cleaning
- Grading and sloping
- Materials handling
- Ripping and loading pavement
- Placing culverts, tanks, curbs, etc.

® Reg. U. S. Pat. Off.

CRAWLER-MOUNTED GRADALL | SELF-PROPELLED GRADALL | RAILROAD GRADALL

Gradall
DIVISION OF WARNER & SWASEY Cleveland
PRECISION MACHINERY SINCE 1880

Distributors in over 75 principal cities in the United States and Canada

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS... WITH A WARNER & SWASEY

Yes, MM Engines are built and equipped to order

FURNISHED TO YOUR SPECIFICATIONS IN LOTS OF 1 OR 100!

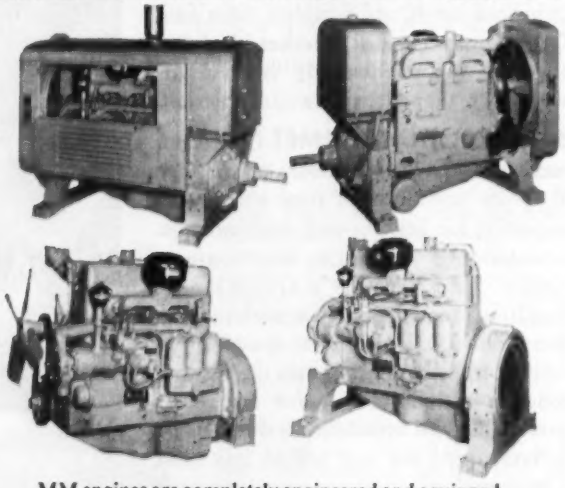
You get power adaption that fits your specifications more readily with Minneapolis-Moline engines. Why MM? Because, as an independent engine builder, no single sales outlet dictates MM engine design—and MM works in such a big variety of power applications.

To meet a wide range of basic requirements MM engines have large displacement for high torque at moderate rpm. Extra high compression and high turbulence combustion combined with high volumetric efficiency provide outstanding performance.

For these reasons MM units are ready to go when equipped with specified operating accessories. You eliminate major auxiliary unit purchases to adapt engine characteristics to meet momentary high load demands. Further long run benefits are low fuel consumption and low maintenance that total up to low cost production.

Every-day experience in supplying a wide range of unit requirements enables MM to maintain customary high quality in single or small lot quantities at reasonable cost.

A high degree of standardization results in high production parts that provide precision fits and permit MM to schedule parts for special units in large quantity, assuring early delivery and customer service.



MM engines are completely engineered and equipped for gasoline, LP gas, natural gas, or distillate fuels. Sizes range from 206 cu. in. portable units to 1600 cu. in. stationary engines and are available for fan to flywheel application or, completely enclosed leg mounted installations. MM also builds a line of industrial Diesel power units: Sizes—283-, 425-, 605 cu. in.

Standard equipment includes vacuum crankcase ventilation, thermostat controlled bypass cooling, packaged water pump, built in variable speed governors, enclosed gear driven oil pump, and oversize full-flow oil filters (shunt-type filters are provided exclusive on MM Thermo-Clad units).

Send details on your application for examples of MM built-to-order packages for original or replacement needs. Engineering service available for pumps, hoists, crushers, generators, shovels, ditchers, cranes, compressors, feed mills, saw mills, planing mills and similar installations. When you want dependable performance year after year from your engine, you want an MM Industrial Power Unit.

INDUSTRIAL DIVISION

MINNEAPOLIS-MOLINE MINNEAPOLIS 1, MINNESOTA

SALES AND SERVICE . . .

Continued from page 187

Syntron Co.: Syntron Baltimore Sales Co., district representatives for Syntron vibratory equipment, conveyors, feeders, power tools and other industrial equipment in the Baltimore area, has announced the appointment of R. S. Price to its sales staff. Mr. Price will be located in the Baltimore office, handling the sale of power tools and paper joggers.

De Walt Inc.: John A. O'Reilly has been named district sales manager for the New Orleans territory which will consist of the states of Alabama, Arkansas, Louisiana, Mississippi and that portion of Florida west of Bristol (Liberty County). His headquarters will be in New Orleans.

The Gorman-Rupp Co.: Ford D. Brown has been named eastern representative for the Metropolitan New York territory through Eastern Virginia.

Nutting Truck & Caster Co.: James R. Douglass of Duluth, Minn., is the recently appointed sales representative in charge of the Duluth territory which includes northern Minnesota, as well as certain counties in northwestern Wisconsin.

Crucible Steel Co. of America: Herbert J. Arnold has been named supervisor of stainless, bar wire and billet sales, with offices in Pittsburgh. Also appointed was Frank J. Coates as supervisor of stainless steel sales, Cleveland, the position previously held by Mr. Arnold.

Moretrench Corp.: Announces the appointment of Edward H. McCabe as its representative in New England and upper New York state.

Insley Manufacturing Corp.: Edwin K. McGill is the new east coast factory sales representative for the sale of this company's excavators, cranes and concrete-handling equipment.

Bucyrus-Erie Co.: Edwin T. Goree has been appointed assistant sales manager, excavator distributors. He will assist R. C. Adams, recently named sales manager. An addition to the Bucyrus-Erie staff is John H. Plehn who has been assigned to the Seattle office.

Euclid Div. General Motors Corp.: Two new district representatives have been appointed: William R. Morrissey will make his headquarters in Buffalo and will represent the company in western New York and in Ontario and Quebec; Donald E. Lutz will be the representative in Arkansas, Louisiana, Mississippi and western Tennessee with headquarters in Memphis.

SALES AND SERVICE . . .

Continued

International Harvester Co.: Wayne E. Greene has been transferred to Chicago where he will be the International motor truck district sales manager, a position which he held previously in the New Orleans district.

The Prime Mover Co.: H. W. Peterson has joined the sales staff and will represent the company in the southeastern states. He was formerly eastern Iowa and western Illinois representative for a construction firm, with headquarters in Davenport, Iowa.

In the Main Office

United States Steel Corp.: Roger M. Blough succeeds Benjamin F. Fairless as chairman of the Board and chief executive officer. Mr. Fairless will continue as a member of the Board of Directors and the Finance Committee of the Corporation. Clifford F, Hood, president of the Corporation since January 1, 1953, was re-elected to that office, and also has been designated chief administrative officer.

Henry Disston & Sons, Inc.: John D. Thompson has been elected president succeeding his cousin, S. Horace Disston, who is retiring after more than 55 yr with the company and who will continue as a director.

American Chain & Cable Co., Inc.: Cyrus N. Johns, president, was elected the company's chief executive officer at the annual meeting of ACCO stockholders held recently. Other changes: Stanley Mann, treasurer-emeritus; Arthur C. Laske, secretary-treasurer, and Wilmot F. Wheeler, Jr., vice-president.

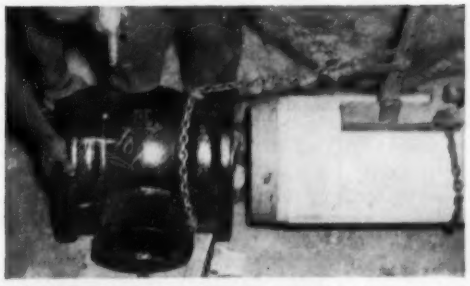
Worthington Corp.: L. V. Gilroy has been appointed distributor-supervisor of Concrete Machinery & Contractors' Pump Division, Plainfield, N. J.

Thomas Industries Inc.: Has named three new vice-presidents: R. W. Minett, Jr., director of merchandising; William L. Tierney, manager of the Contracts and Special Accounts Division; Robert W. Krogstad, engineer in charge of technical administration and research; Frank C. Doyle, treasurer, and John W. Chodera, assistant treasurer.

Koppers Company, Inc.: Theodore W. Chase has been appointed manager of the coupling department where he will have responsibility for design, engineering and sales of the Division's line of industrial couplings used to compensate for the misalignment of power transmission equipment.

Easy handling, fast assembly

Installation follows digger closely



Ring-Tite Fittings, too—You can join pipe directly to fittings, valves and hydrants embodying the Ring-Tite design . . . no special tools needed, no poured joints

You, too, can complete your water-line jobs ahead of schedule and at lower installed cost. Transite Pressure Pipe with the new Ring-Tite Coupling gives you easier handling, simplified and speedier assembly, protects your job with a positive joint seal. Installation can go forward under adverse terrain and weather conditions.

With the Ring-Tite Coupling, installation costs are less—assembly follows the digger closely. The special coupling design permits quick, easy alignment. To assemble, rubber rings are simply popped into grooves. Then lubricated pipe-ends slide in under the rings easily, smoothly, and surely.

Pipe-ends stop positively and are positioned accurately—with ends automatically separated within the coupling. This gives the line flexibility to withstand shock and vibration, relieves line stresses, permits conformance to curves.

Transite Pressure Pipe and the Ring-Tite Coupling are made of asbestos-cement. Strong and durable, they cannot rust; are highly resistant to corrosion. Engineers and water works officials, too, reap the benefits not only of Transite's installed economies but also its assurance of operating economies year after year. For further information write Johns-Manville, Box 60, N.Y. 16, N.Y.

*Excerpt from actual field report: "Exceeded by far the installation speed anticipated under job conditions."

JM JOHNS-MANVILLE PRODUCTS

Johns-Manville TRANSITE PRESSURE PIPE

WITH **NEW RING-TITE** COUPLING

SALES AND SERVICE . . .

Continued

Syntron Co.: C. W. Ramaley has been named manager of the Rectifier Department. James Scott will replace Mr. Ramaley as sales application engineer.

Insul-Mastic Corporation of America: H. L. Stockdale is the new president of this company, succeeding Clifford Off. Mr. Stockdale will move the executive and sales offices from Pittsburgh, Pa. to the plant office building at Summit, Ill.

Johns-Manville Corp.: Edward D. Flavin has been named vice-president of the Sales Corporation and manager of Special Industries, Industrial Products Division, succeeding L. A. Baldwin, retired.

Special Mention

Aeroquip Corp.: Has announced the purchase of a newly completed plant in Toronto, Canada. The new quarters contain 30,000 sq ft of factory area and offices for Aeroquip's recently formed Canadian subsidiary, Aeroquip (Canada) Ltd.

Diamond Expansion Bolt Co.: Has established completely new facilities in Detroit under the direction of Jim O'Leary. The warehouse will maintain complete stocks of Diamond products.

Whiteman Manufacturing Co.: Has purchased all stock of the Concrete Equipment Manufacturing Co. (Los Angeles), manufacturers of transit concrete mixers. Whiteman is in the process of expanding its own facilities, making concrete finishing and screening equipment.

Lindquist Pump Corp. of Texas: New general sales offices and engineering department are now located at Torrance, Calif. A new board of directors and executive group have been formed: Henry L. Seale, president and chairman of the Board: Joseph D. McNeff, executive vice-president; John Erhard, secretary and Thomas A. Benavides, general sales manager.

Thew Shovel Co.: Announces the completion of negotiations by which the plant and inventory of the former Byers Machine Co. of Ravenna, Ohio, have been acquired. A new subsidiary corporation, Byers Machine, Inc., has been formed to operate the plant in Ravenna. The company will be headed by A. C. Lundgren as president. Other officers are: E. C. Brekelbaum and W. V. Clark, vice-presidents; R. W. Gleason, secretary and treasurer; Brooks Maccracken, assistant secretary.

1949 Within 48 hours after pouring this concrete, the section was open for all traffic.

1955 The same section after more than 5 years of relentless beating shows no evidence of wear.

Owner: Port of New York Authority

Contractors: Moser Contracting Co., Inc. Long Island City, N.Y.

Ready Mixed Concrete: Metropolitan Sand & Gravel Corp., New York City

LEHIGH EARLY STRENGTH AIR-ENTRAINING CEMENT

solved a problem of

TIME and TRAFFIC!

In 1949 several badly worn sections of pavement on the George Washington Bridge had to be replaced. To do the job with minimum inconvenience to the public called for good management, fast work . . . and a quick curing concrete that could take the pounding of heavy traffic in the shortest possible time.

Using Lehigh Early Strength Air-Entraining Cement, and a vacuum curing process, the contractor opened sections to all traffic within 48 hours after pouring concrete. During the entire job, bridge traffic moved without interruption. Today, after more than five years, these new sections show no evidence of wear—despite the daily drubbing from 90,000 vehicles.

That's construction speed and durability, the combination you get with Lehigh Early Strength Air-Entraining Cement. A name to remember when your problem is time and traffic.

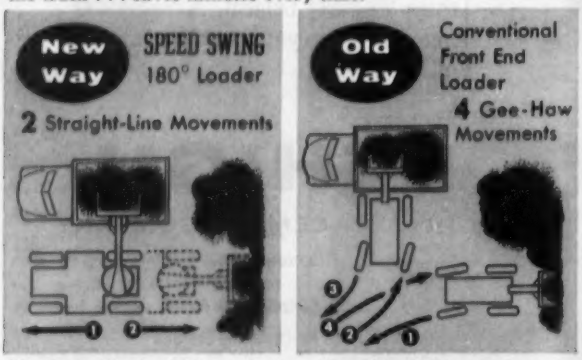
LEHIGH

PORTLAND CEMENT COMPANY

Allentown, Pa.

- **Lehigh Early Strength Cement**
- **Lehigh Air-Entraining Cements**
- **Lehigh Portland Cement**
- **Lehigh Mortar Cement**

Loading Is FASTER, too! No gee-hawing for position. Simply back away from the pile as the boom swings the bucket over the truck . . . saves minutes every time.



The Swing's the Thing for Faster Loading! The time-saving, money-saving advantages of Speed Swing are apparent from these diagrams. Bulletin P174 gives full details!

180° Boom Swing Is the BIG Difference!

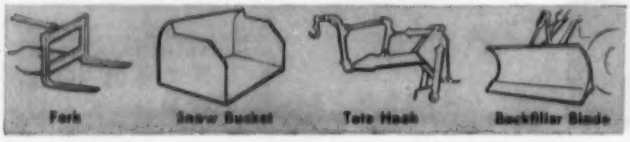
The swing's the thing—especially when space is tight. See what the problem would be without Speed Swing on this street job. Four wheel steer available for really tight spots.

Longest Forward Reach of Any Loader! All important when loading front of trucks over the tail gate. It's a big feature, too, with fork and tote hook attachments.

Ask for 44 Page Booklet Illustrating Over 70 Products Made by PETTIBONE

75 years of Pettibone heavy equipment manufacturing experience back Speed Swing. More than 300 models and sizes of over 70 construction equipment and material handling products made by the Pettibone Companies are shown in Bulletin P200. Ask for it!

PETTIBONE SPEED SWING



Another Member of the Labor-Saving "Speedy" Material Handling Family!

PETTIBONE MULLIKEN CORP.

4700 W. DIVISION ST. • CHICAGO 51 • SPAULDING 2-9300

SALES AND SERVICE . . .

Continued from page 194

Mack Trucks Inc.: Buckley - Mack trucks, distributor of Mack trucks in Watertown for 16 yr, has begun construction of a second Mack sales and service building on the Massena-Raymondville Road, 2½ mi from Massena. Richard Buckley, associated in the Watertown business with his father, Ralph J. Buckley, and brother, Theodore C. Buckley, will manage the company's Massena operation.

Vickers Incorporated: Awarding of the contract for construction of the company's new engineering and administration building has been announced. This will be located on a 76-acre site in suburban Detroit.

Association Activities

Wire Reinforcement Institute, Inc.: Richard H. Frizzell, sales manager of the structural products department, Wickwire Spencer Steel Division (Buffalo, N. Y.) of the Colorado Fuel and Iron Corp., has been elected president. He will guide a broad program of research and education aimed at improving both welded wire fabric and the product it reinforces, and at extending its uses.

Vermiculite Institute of Chicago: Dayton L. Prouty of Dearborn, Mich., vice-president of the Zonolite Co., was elected president at the group's 14th annual convention. Charles Goyer of Montreal and C. H. Wendel of Los Angeles, Calif., were named to the board of directors. W. J. Bein, vice-president of Zonolite Co., Chicago, was re-elected treasurer, and Edward R. Murphy of Chicago was returned as managing director.

American Institute of Timber Construction: Frank B. Benzon, president and general manager of Timber Structures, Inc. of California, Richmond, Calif., was elected president at the annual meeting in San Francisco. George E. Schweitzer, vice-president in charge of sales, Rilco Laminated Products, Inc., St. Paul, Minn., is the new vice-president. Newly elected directors include Ward Mayer, founder and general manager of Timber Structures, Inc., Portland Ore., and E. D. Seaver, executive vice-president, Summerbell Roof Structures, Los Angeles, Calif.

Answers to Quiz on Page 75

1. 37 billion
2. 15 billion
3. 9,400,000
4. 39½ billion

How did you make out?

CONSTRUCTION EQUIPMENT NEWS

Self-Propelled Drill

Air Trac, a crawler-mounted drill carrier, works on steep sites. Powered by individual air motors for each track, the unit has sufficient power to haul an 11,720-lb compressor up a 10% grade.—**Gardner-Denver Co., Quincy, Ill.**

Light-Wheeled-Tractor

The Super 77 and Super 88 industrial wheel tractors are available with gasoline or diesel engines. The new models boast higher power with the Super 77 developing 40 hp and the Super 88 49.8 hp. Optional are front-end loader, straight-line loader, side-mounted mower, snow plow, backfill blade and rear-mounted backhoe. The Super 88 also operates a ½-cu yd hydro-trencher. Gasoline engines have a 7 to 1 compression ratio.—**Oliver Corp., 400 W. Madison St., Chicago, Ill.**

Truck-Mounted Asphalt Mixer

The HTB-B asphalt mixer can be quickly mounted on the rear of any standard dump truck. This arrangement makes it possible for small crew to haul, mix and lay asphalt in a number of widely separated locations, an ideal arrangement for low-cost patching. The unit handles up to 5 tons of hot mix or 10 tons of cold mix per hr.—**K. E. McConnaughay, Main & 6th St., Lafayette, Ind.**

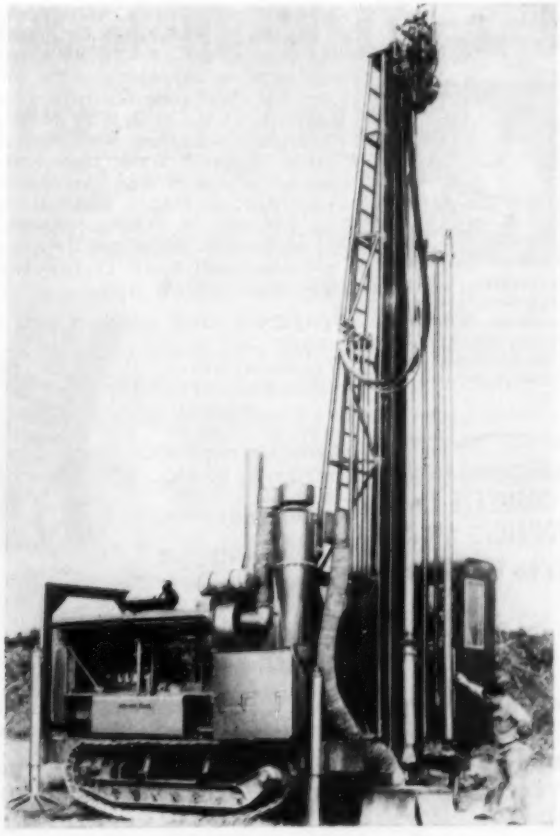
Easily Convertible Trowel

Powered with either a pneumatic or electric motor, or a 2-cycle or 4-cycle gasoline engine, the troweling machine converts to 26-, 36-, or 45-in. capacity. Any of the power heads will also power a floating disk and grinding-grouting head. A new clamp ring expedites switching to any of the four power heads or to a replacement engine.—**Mall Tool Co., 7725 S. Chicago Ave., Chicago 19.**

On-the-Job Previews of Machinery, Tools and Equipment

Attachment Adapts Shovel for Low-Clearance Work

The Excaloader adapts the new 1-yd LS-98 shovel for horizontal, straight-line loading operations. The Excaloader is interchangeable with the shovel, hoe, dragline, clamshell or crane attachments for the LS-98. The unit requires only 15 ft 10 in. clearance height. An optional unit has a minimum clearance height of onlv 11 ft 3 in. Maximum dumping height with stick extended at 45 deg is 16 ft 11 in. Although it's a new attachment, the manufacturer says the unit has been fully tested for 18 months. The straight-line bucket action makes the machine valuable for grading and cleanup or loading from stockpiles. The bucket can be tilted to dump position and used for dozing.—**Link-Belt Speeder Corp., 307 N. Michigan Ave., Chicago 1, Ill.**



Largest International Scraper

The new 75 Payscraper is the largest high-speed, rubber-tired earthmover in the International line. Its 262-hp engine enables it to scoop up an 18-cu yd heaped load and then highball along at more than 24 mph. To take care of the 31½% boost in engine power, the entire power train has been strengthened. Increased gear reduction at the final drive puts less torque on the transmis-

(Continued on page 200)

←

Triple-Duty Rock Drill

The new Drillmaster is a self-contained drilling unit designed to speed the drilling of rock and provide a range of hole sizes and depths heretofore unavailable in a blast-hole drill. The unit can drill in three ways. In Method 1, it utilizes the Depth-Master, a down-the-hole drill for deep holes up to 6 in. in dia. In this meth-

(Continued on page 200)

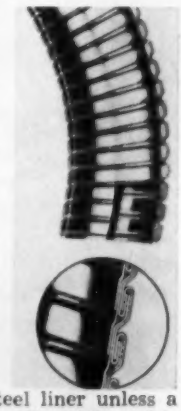
EQUIPMENT NEWS ... Continued

LARGEST SCRAPER ...

sion and reduces shock loads. A new, disk-type cable control has also been added. The controls are easier for the operator to manipulate, both when loading and ejecting. The bucket-type seat, upholstered in foam rubber, has now been made adjustable. The machine has 4-wheel brakes. Heavy-duty, two-shoe air brakes are synchronized on both the tractor wheels and the wheels of the scraper. Auxiliary hand-operated air control provides individual braking of the drive wheels for short turns. The unit is designed for faster, easier loading. In tough going, the entire weight of the scraper bowl rests on the cutting edge, giving added penetrating force. The tractor has five forward speeds and one reverse speed ranging from 2.77 to 24.75 mph. The weight of the unit is 52,000 lb.—**International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.**

TRIPLE-DUTY ROCK DRILL ...

od a Carset bit is inserted directly in the front-head of the drill so that no power is wasted overcoming the inertia of long, heavy drill steels. In Method 2, it utilizes the Power-Master, a heavy-duty hammer drill for 4½-in. holes up to 60 ft deep. This unit is said to use less air and have greater drilling speed than any other drill in its class. In Method 3, the Roto-Master, a rotary drill head which is standard Drillmaster equipment, will drill holes up to 6¼ in. This unit provides the rotation for roller-cone bit drilling and rotation for the other two methods. Additional features include an easily lowered tower that is tall enough to provide long steel changes, positive chain feed, a dust collector, an I-R 600-cfm rotary compressor and a motor-driven crawler assembly.—**Ingersoll-Rand, 11 Broadway, New York 4, N. Y.**



CONVEYOR HOSE — A new flexible metal hose, designed to carry materials having abrasive and corrosive characteristics, such as cement, has recently been announced. Two types will be available — type U-100-L standard weight and type U-120-L heavy-duty. Both types will be furnished with a stainless steel liner unless a carbon steel liner will satisfy and is specified. Available in six standard sizes from 3 to 8 in.—**Universal Metal Hose Co., 2137 S. Kedzie Ave., Chicago 23, Ill.**

GEO. M. BREWSTER & SONS, INC. ADDS 4 NEW LORAIN 85's

THE SEVENTY-SEVENTH LORAIN—to be purchased through the years by George M. Brewster & Sons, Inc., Bogota, N. J., is the new Lorain-85 shown above. It's one of four new "85's" just added to the fleet of this well-known contractor, two of which were immediately assigned to the New York Thruway job. Brewster's contract calls for 2½ million yards of grading on a 4.7 mile section near Nyack. The Lorain-85 is digging a mixture of clay and rock with a 2½-yd. dipper and a 26-ft. boom. Brewster's repeated confidence in Lorains tells all that can be said about profit-making performance.

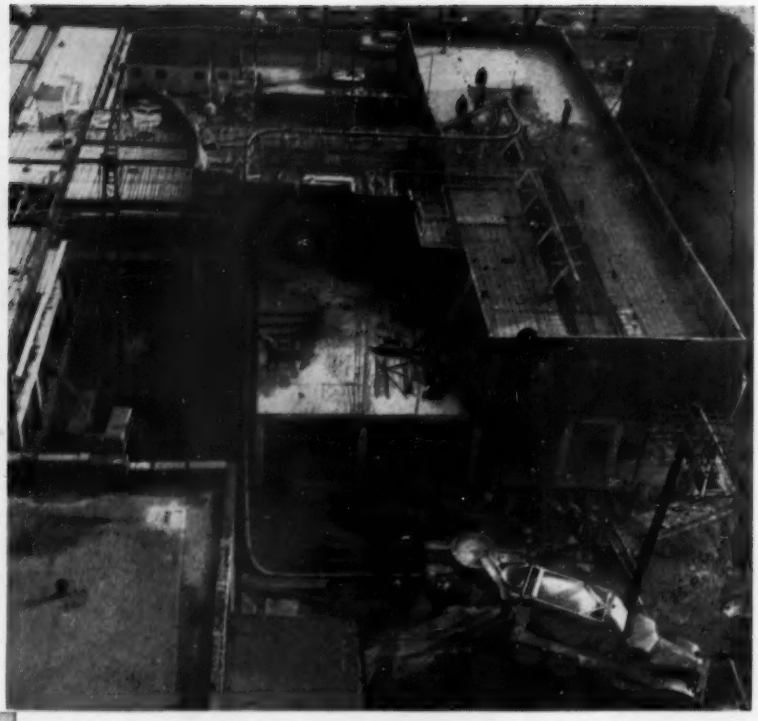
Let your Thew-Lorain Distributor tell you the complete story about the new Lorain-85 . . . or let him fit your job with one of the many crawler or rubber-tire types in the complete Lorain line. Bid your next job on new Lorain performance!

THE THEW SHOVEL CO., LORAIN, OHIO

In the new Lorain-85's, many new features go to work for Brewster . . . these include:

- FULL AIR CONTROLS • metered air operation of crowd and retract • power boom lowering and derricking • crawler travel • dipper trip • crowd brake • steering • tread lock.
- GREATER OPERATING RANGES • 26 ft. shovel boom • 27 ft. hoe boom.
- GREATER CAPACITY • 45 tons lifting capacity.
- THIRD DRUM • power load lowering • backing down the load.
- WIDER CRAWLER • with 2 speeds in both directions.
- REMOVABLE COUNTERWEIGHT.
- TORQUE CONVERTER available.

THEW LORAIN



Pumpcrete® is located in the alley where it is accessible to truck mixers and away from traffic. Concrete is delivered to third floor of "H" shaped building by pipeline, 160 feet from alley. Note pipeline set in place for pour on other half of floor.

Small crew distributes and vibrates concrete in place. Note absence of cumbersome runways and buggies. Pumpcrete placed approximately 2200 yards of concrete for the building, averaging 15-18 yards per hour.

Reports: "nice going... with PUMPCRETE!"

concrete by pipeline saves time and money on new Chicago building

By eliminating conventional concrete-handling equipment—buggies, runways, lifts—contractor for this four-story "H" shaped structure on Chicago's North Side was able to place concrete at less cost, faster and better with Pumpcrete—the pump that delivers concrete by pipeline!

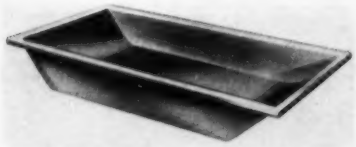
Construction supervisor Harold Arnold of Sumner Sollitt Company, Chicago, reported Pumpcrete eliminated expensive handling equipment. Iron workers, electricians and other trades were able to work on schedule, undisturbed by placing operations—"it's nice going with Pumpcrete."

The single Model 160 Pumpcrete was located in the alley to the rear of the building . . . out of the way of street traffic and easily accessible to truck mixers. This arrangement relieved traffic congestion and expedited over-all job progress.

Investigate the job-speeding, cost-cutting advantages of Pumpcrete on your next job. See your local Rex Distributor or write Chain Belt Company, 4664 West Greenfield Ave., Milwaukee 1, Wisconsin.

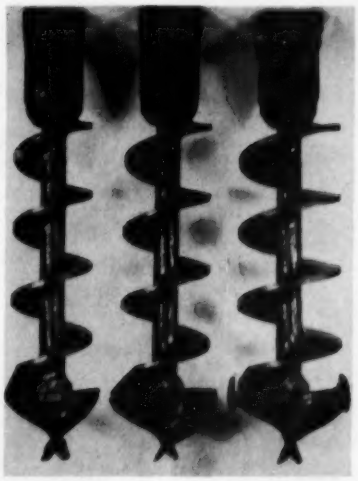
CONSTRUCTION REX MACHINERY

CHAIN BELT COMPANY

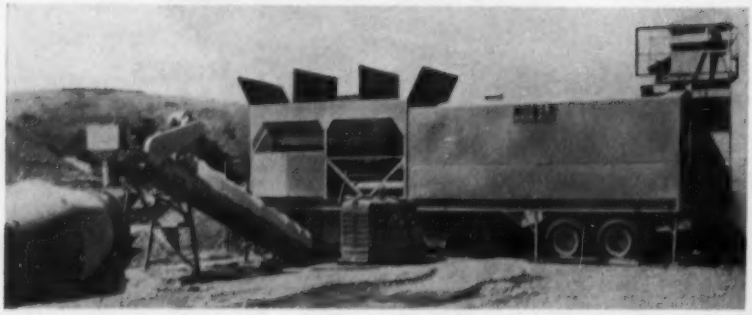


MORTAR BOXES—New 14-ga steel, one piece mortar boxes are completely nestable. 50 boxes stacked one inside the other would not reach a height of 6 ft. All boxes are leakproof and easy to clean; all corners are lapwelded. The box is rigid without added weight. The tubular section around the box forms a convenient handle. Each box measures 12 in. high and is available in five different widths and lengths ranging from 2½ ft wide by 4 ft long, through 4 ft wide by 8 ft long.—**Anchor Mfg. Co., 2922 W. 26th St., Chicago 23, Ill.**

DOUBLE-ACTION HAND PUMP—Of lightweight aluminum alloy, this pump has a capacity of 1.5 cu in. per cycle with operating pressures up to 1,500 psi. The new pump—Model H1601—features a plated piston, positive check valve and quick release valve. The unit is of single lever operation and provides accurate lowering control. The handle holder reverses for horizontal or vertical pumping action. Easy four-bolt mounting. Specifications are 9x5½ x7 in., oil capacity 150 cu in., weight 9 lb (less handle); ¼-in. NPT. portings. Available with or without 14-in. handle.—**Wisconsin Hydraulics, Inc., 3165 N. 30 St., Milwaukee 16, Wis.**



EARTH AUGERS—PENGO 6-, 7-, and 8-in. dia. heavy-duty flight augers are being produced to fill a need for a small diameter yet heavy-duty flight auger for use with earth-boring machines. According to the manufacturer, they are the only augers on the market today that are so designed.—**Petersen Engineering Co., Santa Clara, Calif.**

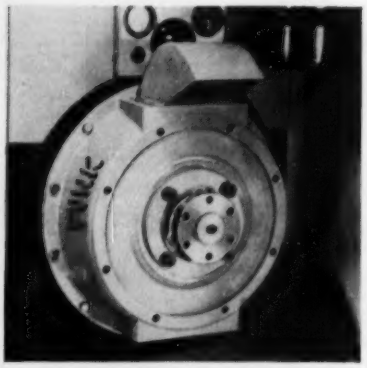


MOBILE BATCH PLANT—Originally developed by Cupertino Ready-Mix, Inc. of California (CM&E, Dec. 1954, p 106), a completely self-contained mobile batching plant is now in general production. Built like a semi-trailer, the plant has its own cement storage, motor generator to provide operating power, and covered belt conveyor for mix-truck loading. The plant will produce approximately 500 cu yd of dry-batch concrete in an 8-hr day. The manufacturer claims that it can reduce concreting costs by as much as one-third by reducing the haul distance required of transit-mix trucks.—**Nobel Co., Oakland, Calif.**, in cooperation with the **Fruehauf Trailer Co., Oakland, Calif.**

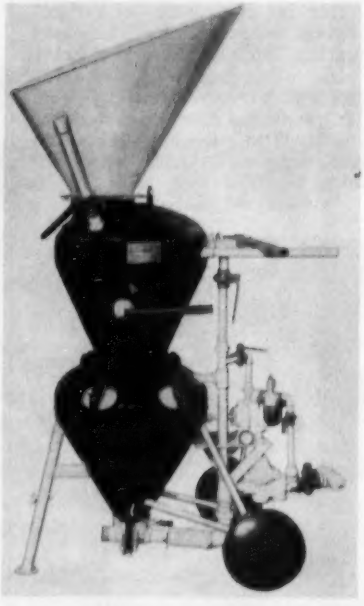
SHAWNEE SPECIAL — First of a new line for light tractors, the Shawnee Special loader adapts to the A-C WD 45. Unit features a crankshaft-driven hydraulic pump. Double-acting cylinders provide loading height to 9 ft. Buckets 48- and 66-in. dia are available. The simple design of the new loader provides the operator with excellent visibility — **Shawnee Mfg. Co., 1947 N. Topeka, Topeka, Kan.**

SPRAY GUN—P-300 is an air-operated siphon paint spray gun, designed to operate on air pressure as low as 5 lb. psi. It is light in weight and draws from a 1-qt cup.—**John B. Moore Corp., Peerless Bldg., P.O. Box 3, Nutley 10, N. J.**

SUMP RECEIVER—New Zurn roof sump receiver is especially engineered for flat roofs. Of precast concrete or gypsum slab-deck construction, the new sump receiver assures installation of the drain flush with the plane of the roof, while eliminating the need for chamfering or other special preparation. Used with insulated decks, precast tile blocks, corrugated composition paneling or other light construction materials, the Zurn sump receiver reduces "roof-strain" by distributing the weight of the drain installation over a larger segment of the roof area and assures that the top of the drain will be flush with the plane of the roof. Made of steel with a corrosion-resistant finish and will fit all Zurn roof drains.—**Plumbing Division, J. A. Zurn Mfg. Co., Erie, Pa.**

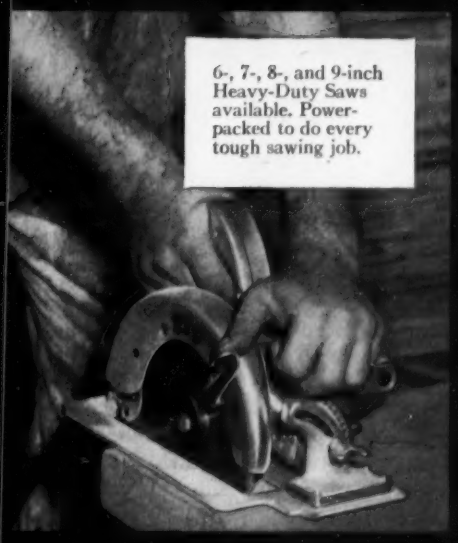


TORQUE CONVERTER—This new torque converter the Funk Model C-20 is an exceptionally short coupled torque converter for use where length is a problem. It is available either in ventilated or non-ventilated types. The main body is one-piece steel casting machined to fit engines with SAE flywheel housing. Standard outside flanges attach quickly to right-angle drives, transmissions, gear reductions, power take-off hubs or other types of drives.—**Funk Aircraft Co., Coffeyville, Kan.**



BLASTCRETE GUN — This unit is designed to handle material of high moisture content, making it no longer necessary to buy dry materials or protect them from moisture conditions. Rebounds are immediately reusable. The flow of material is easily adjustable while the gun is in operation. A new slide valve for the loading chamber assures faster and easier loading. The unit places 1 to 8 yd per hr or approximately 2 yd per hr per 100 cfm of air.—**The Blastcrete Equipment Co., 11154 Santa Monica Blvd., Los Angeles 25, Calif.**

For star drilling, slotting, demolition on every job where impact is needed . . . B&D Hammers. 4 models.



6-, 7-, 8-, and 9-inch Heavy-Duty Saws available. Power-packed to do every tough sawing job.

World's most popular general purpose drill . . . B&D ¼-inch Standard Ball-Bearing Drill.

New B&D 7-inch Heavy-Duty Sander-Grinder has 90% more power to sand, grind, cut, brush.

Make light work of heavy construction projects

Get the best results on all construction projects by putting Black & Decker Tools on every job. All these tools are compact, easy to handle, light for their tremendous power. All have B&D-built motors specially designed just for the tool and the job to be done. Choose the ones you need . . . and get jobs done . . . fast, accurately and cheaply. See your B&D distributor for demonstrations or write for additional information. Address: THE BLACK & DECKER MFG. CO., Dept. 2606, Towson 4, Maryland.

For nearest distributor, see "Tools-Electric."

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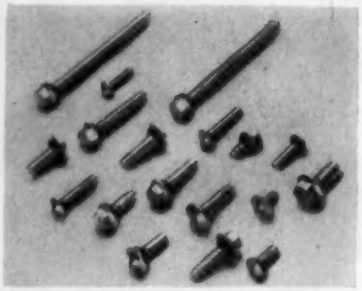
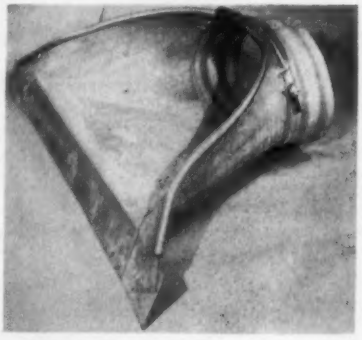


MULTI-PURPOSE FASTENERS—A one-piece metal washer head and assembled neoprene washer for use in preventing leaks, for protecting surfaces, absorbing shock and stopping leaks is called Tuff-Tite. In addition to providing water-tight fastening of various materials, the neoprene washer also acts as a shock absorber, making it useful where vibration and noise are a problem. They are available in stainless, carbon and alloy steel, as well as many non-ferrous metals such as aluminum and copper.—**Townsend Co., New Brighton, Pa.**



CULVERT END—A new type of "end section" for corrugated metal structures which is said to cut both material and installation costs has two side lugs and a length of galvanized rod threaded on each end. It is an alternate type of connection for use in 30- and 36-in. dia pipe, and pipe-arches from 18 to 11 in. to 58x36 in. On pipe from 12 to 24 in., a full circumferential rod and lug are used. On 42- and 48-dia pipe and the two largest pipe-arches—65x40-in. and 72x44 in.—end-sections are fabricated with a riveted-on connector section and joined to the culvert barrel with a standard band coupler. The new type of connection provides ample strength and makes possible a reduced selling price because of material and fabricating savings. The unit price installed also is less, because of lower material and labor costs and elimination of the connecting band. A third advantage is claimed from better nestability and its greater conveniences in transportation, storage and handling.—**Armco Drainage & Metal Products, Inc., Middletown, Ohio.**

C&D Movall

Dumps and Spreads any Material You Can Load with Shovel, Dragline or Belt Loader

C & D MOVALL saves on grading by spreading fill approximately 10" deep on long runway.

Has Positive Ejection, Controlled Discharge; Dumps Sticky Materials Clean, Spreads Fill Like a Scraper

MOVALLS, teamed with Caterpillar DW20 or DW21 tractors, handle 31-ton, 25 cu. yd. (heaped) loads of any material that can be loaded with shovel, dragline or belt-type loader. They can spread "on the go" in even lifts of any desired depth, dump at controlled rate into hoppers, or eject full loads in 12-14 seconds over the edge of a fill. Power ejection with a 140,000-lb. push scrapes out sticky or frozen materials whistle-clean, boosts out heavy rock in a hurry. No other haul unit available today has such a wide work range.

Easily Interchanged With Scrapers

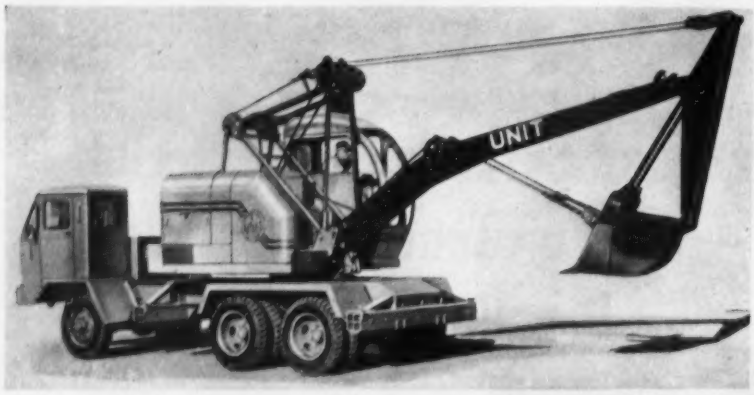
If you own Cat DW20 or DW21 tractors with scrapers, you can equip for any top loading job in any material just by adding MOVALLS. Exclusive C & D interchangeable yoke makes it easy to change from scrapers to MOVALLS or vice versa, or to switch prime movers. You get the proved performance, economy and reliability of your Cat prime mover, plus the unmatched work range of the MOVALL—at far lower cost than a self-powered haul unit.

MOVALL is only end-dumping haul unit that keeps center of gravity low while dumping—uses power, not just gravity, to get the load out.

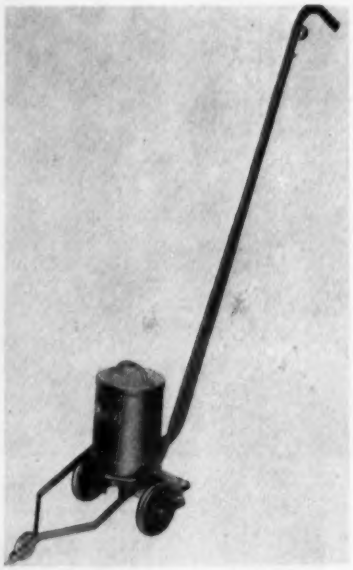
Performance-proved

MOVALL's rugged construction and versatility have been amply proved loading heavy rock under 2½ to 6-yd. shovels, handling mud and sticky clay on highway and dam jobs, spreading subbase and surfacing materials on airport and road work, and scores of other jobs.

Why limit your earning power with a one-purpose haul unit? Investigate—see your Caterpillar distributor or wire us now about a MOVALL demonstration on your job. C & D MANUFACTURING COMPANY, Perkins (suburb of Sacramento) California; phone HIllcrest 5-8592.



NEW UNIT CRANE — The ⅜-yd Challenger model 510, completely new in design and construction, embodies the features of hydraulic clutch control, full floating trunnion-mounted tapered drums, self-aligning hook shoes that distribute pressure over a maximum bearing area, force-feed lubrication and full range vision safety cab with large side entrance. Powered by a Ford heavy-duty industrial engine with torque converter. — **Unit Crane & Shovel Corp., 6411 W. Burnham St., Milwaukee 14, Wis.**



LINE MARKER — The new Jawco Model 250 line marker is used to paint 2-, 3-, and 4-in. lines on any hard surface. Brush sizes can be used interchangeably. The operator easily maintains the desired pressure on the brush simply by varying the position of the liner handle. The brush can be lifted completely off the painted surface by raising the handle. Paint flow is accurately controlled by a valve lever on the handle. Available in two capacities, 2 and 4 qt.—**Jawco Products Corp., P.O. Box 1224, York, Pa.**

SCREW DRIVERS—The new "Roto-Top" screw driver features a unique handle top which remains fixed in the heel of the hand as the screw driver is turned. It is said by the manufacturer to minimize fatigue and soreness, screw faster, and with greater ease. Fluted handles are of shock-proof, unbreakable tenite in transparent amber, with a red top. Introductory set includes three regulars, with 4-, 5- and 6-in. blades, and two Phillips head with 3- and 4½-in. blades. Sold exclusively for $3.95 ppd. for set of 5; or $2.60 for set of 3 regulars.—**Time Manufacturing Co., Dept. 324, Westminster, Mass.**

USS COR-TEN Steel pays off

...in this equipment noted for stamina and big capacity!

THIS C & D Movall rock and dirt wagon owes much of its lighter weight, greater strength and greater capacity to the use of USS COR-TEN High Strength Steel in its construction. USS COR-TEN steel comprises 65% of the total material used in this unit, makes possible the 17% savings in weight and contributes immeasurably to its greater capacity—19 cubic yards struck, 25 cubic yards heaped, with a maximum capacity of 31 tons. In the interior of this wagon USS COR-TEN steel is used for the top steel wear plate and the bottom steel plate which form a sandwich around a 2" core of hardwood. COR-TEN steel is also used for the abrasion-resistant wear strips.

As shown here, the C & D Movall, made by Yuba Mfg. Co. for C & D Mfg. Co., Perkins, Calif., is pulled by a CAT DW 21 Tractor, made by Caterpillar Tractor Co., Peoria, Illinois. With a change in gooseneck it can also operate with a CAT DW 20 Tractor. Some of the features which make this wagon especially versatile and popular are its bigger target – 11 by 19 feet, its controlled scraper-like spreading action, its ease of maneuverability, its clean dumping and its safety features.

• • •

C & D, Yuba and other companies specializing in the construction of heavy-duty earth-moving equipment have a long record of use of USS High Strength Steels. This is convincing proof of the ability of these steels to give equipment the stamina to stay on the job.

USS COR-TEN, USS MAN-TEN and USS TRI-TEN Steels resist wear, impact and abrasion. They have a yield point 50% higher than carbon steel. With these outstanding steels it is possible to build unusual strength and toughness into vital parts ordinarily prone to failure. With them you can materially increase the strength of parts without increasing their weight. Or you can use these steels in lighter sections in place of carbon steel to reduce weight without reducing strength and stamina.

For more information on these superior, service-tested steels get in touch with our nearest sales office.

SEE The United States Steel Hour. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

NOW AVAILABLE

Our new "Design Manual for High Strength Steels" is ready for distribution. This excellent book contains comprehensive and practical information that you will find extremely useful in designing your product for greater economy and efficiency by the sound use of high strength steels.

For your free copy, write on your company letterhead giving your title or department, to United States Steel Corporation, Room 4726, 525 William Penn Place, Pittsburgh 30, Pa.

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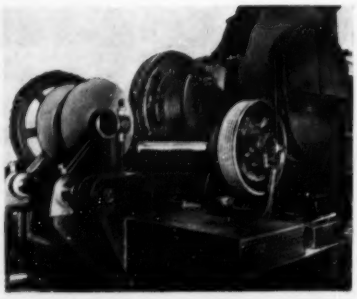
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS COR-TEN High Strength STEEL

USS

UNITED STATES STEEL



THIRD - DRUM ASSEMBLY — A third-drum assembly, particularly useful in pile-driving work or for any other purpose where a third hoist line is needed, is now available for Bucyrus-Erie 38-B, 51-B and 54-B machines equipped with lifting crane or clamshell. The auxiliary assembly can be mounted on any of these models, provided that they do not have independent propel. Drum capacity is approximately 300 ft, using ¾-in. dia. cable. For a single part line, maximum load is 10,000 lb, and the line speed is 160 ft/min.—**Bucyrus-Erie Co., S. Milwaukee, Wis.**

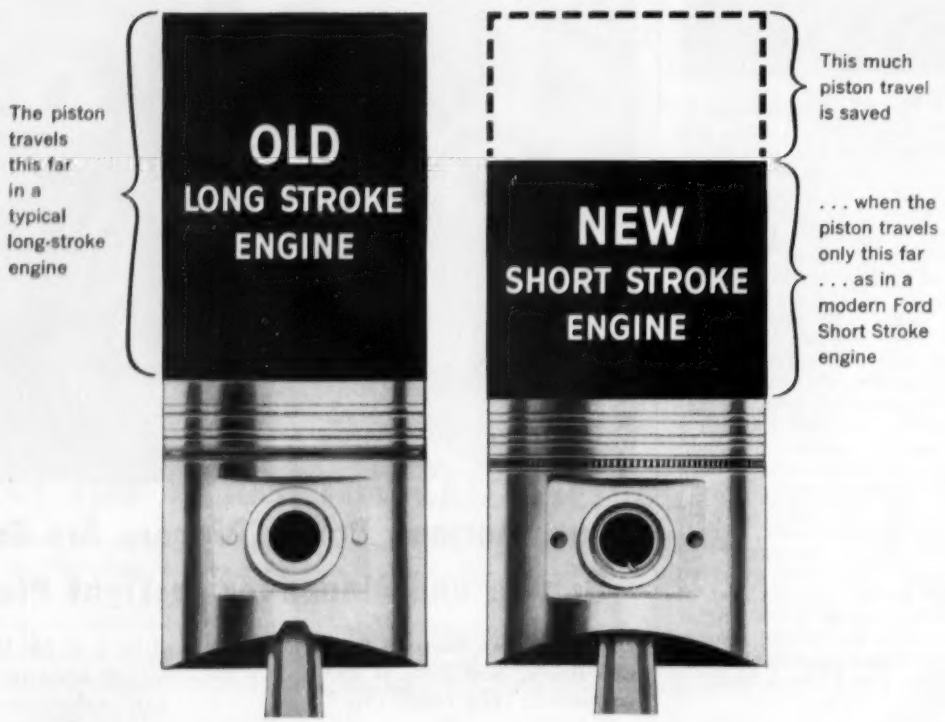
CHAIN WRENCH—The new Reed chain wrench is said to out-perform conventional pipe wrenches in several respects. The chain and jaw grip permits working in tight corners where there is too little clearance for the head of a conventional wrench. It is also possible to tighten and back off a pipe or fitting without taking the wrench from the pipe or changing the setting. Although the jaws of the wrench are of hardened steel, they are easily replaceable, extending the life of the tool indefinitely. Their design permits a fast ratchet-like action in either direction from either side of the pipe or fitting. The wrench it is claimed, will hold and turn any shape, round, square, hex or irregular, firmly, without play and without crushing. The wrench is offered in 10-, 14-, 18-, 24- and 36-in. lengths.—**Reed Mfg. Co., Erie, Pa.**

ASPHALT PLANT—The capacity of the Model L-8 asphalt plant has been increased from 8-10 tons to 10-15 tons per hr. The increase is because of a larger oil burner on the aggregate dryer and improvement of dryer-drum construction. Batch discharge from pug mixer has been raised to an average of 850 lb. Other improvements include a reciprocating plate feeder with divided hopper, and two separate discharge gates feed sand and gravel in any desired proportion. This mechanical feeder is chain-driven from the aggregate loading elevator and has a 2-cu yd capacity hopper. One-man operation is an outstanding feature of the L-8 asphalt plant. Air-operated controls, supplied with air from a built-in compressor, permit quick handling of aggregate and final mix. All equipment is driven by a single power unit, a choice of 50-hp gasoline engine, diesel engine or 30-hp electric motor. The plant is self-contained on a rigid steel frame. **—White Mfg. Co., Elkhart, Ind.**

BATCH PLANT—A new batch-type bituminous mixing plant, the H-15, has a capacity range of 35 to 60 tons per hr. The pugmill mixer has a capacity of 15 cu. ft. The H-15 is a stack-up, tower-type machine and is extremely easy to erect since the sections are self-contained units. It is offered as a portable or stationary plant with a choice of combustion engine or electric drive motor. To make a complete mixing plant it requires the addition of a drier unit. **—Iowa Mfg. Co., Cedar Rapids, Iowa.**

Look under the hood!

Something **NEW** is happening to truck engine design . . .



The big news in truck engines is modern *short-stroke design.* Piston rings last up to 53% longer. Engine friction is cut as much as 33%. You save up to 1 gallon of gas in 7. Only Ford has Short Stroke design in *every* engine—V-8 or Six—in *every* truck.

Save money on your job with a Short Stroke Ford T-800 BIG JOB. It's the payload leader of its class—takes as much as two tons more load than other tandem-axle trucks. New 42,000 lbs. GVW. Latest rubber-bushed suspension system, power divider drive. New 11,000-lb. capacity front axle and heavy duty front springs available. Power Steering is standard.

Differences between outdated long-stroke engines and Ford's modern Short Stroke design may seem small, but actually they're *not.*

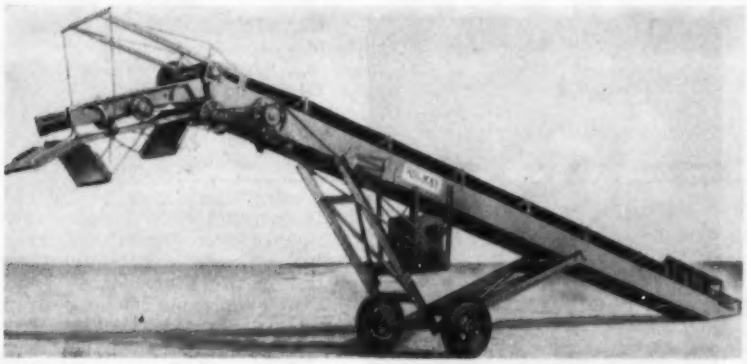
In one case, for instance, Ford's stroke is shorter by 1⅔ inches. A small matter? This shorter stroke means 2,090 miles *less piston travel per year*—per piston—in an average year's driving of 11,000 miles.

Less piston travel means less friction . . . less wear. And that means lower upkeep costs, longer engine life, greater gas savings and more usable power.

Be sure your next truck has a modern short-stroke engine that will not be outdated at trade-in time. You *will* be sure if it's a FORD Truck. Because Ford *and Ford alone* gives you a Short Stroke engine in every model.

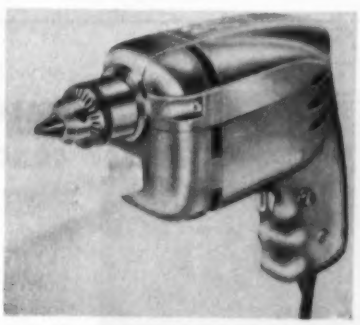
Ford Triple Economy Trucks

THE MONEY MAKERS FOR '55



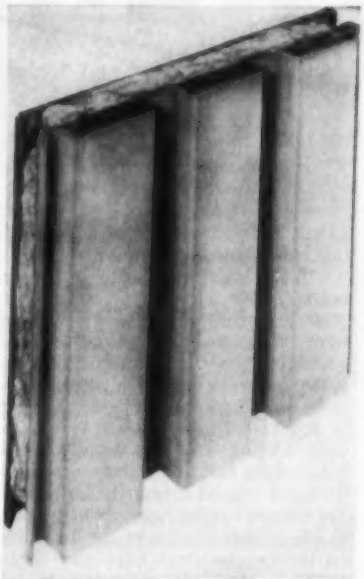
JUNIOR CONVEYOR—A low-cost portable conveyor of box-type construction stout enough to carry a loading trap and large vibrating screen without extra supports is available in 18- and 24-in. widths. Portable models are made in 30- to 50-ft lengths. Stationary models are available in longer lengths as desired. The boom section is of fabricated 3/16-in. steel plate pressed into a channel form 16 in. deep with 2-in. legs. Structural angles join the two sides, and additional strength is provided by the steel belt cover which fits on top, making the box formation. Thus the return belt is completely encased so that material cannot work in from the sides to cause belt damage. Vibrating screens and loading traps can be added to provide a complete portable conveyor-screen plant. Designed to be used with many means of feeding such as dozer, shovel and dragline, the plant is a most versatile unit. Major operating features include the bar-type head pulley, self-cleaning tail pulley, anti-friction ball bearings, choice of regular or greaseless idlers, and heavy-duty truck-type axles, hubs, wheels and pneumatic tires. The Carriage Truck assembly is designed to provide low clearance for road travel.—**Kolman Mfg. Co., Sioux Falls, S.D.**

TWO-WAY RADIO—This new GE unit is capable of transmitting up to an 110-w signal. Previously, highest power standard mobile radio was capable of transmitting only a 60-w signal. The new radio operates in the 25-50 megacycle band and is particularly useful for mobile-to-mobile and mobile-to-base communication over great distances. The new super-power set may be mounted either under the dashboard or in the trunk. The unit is composed of separate transmitter, receiver and power supply chassis connected only by electrical cables terminated in standard, quickly disengaged plugs and receptacles. The chassis may be mounted in a standard relay-rack type mobile housing, either 14 or 17 in. wide. The 17-in. housing allows the use of an accessory strip for tone signalling or other equipment. Either housing may be mounted under the dashboard. The unit may be switched between vehicles having either 6 or 12 v dc systems without electrical alterations. — **General Electric Co, Syracuse, N. Y.**



WORK-LITE DRILL—A new standard-duty ¼-in. drill with a built-in work light, is a boon on all jobs requiring drilling in dark, hard-to-get-at places. With the Fairchild Work-Lite drill, the need for bulky drop cords is eliminated. Powered by a ball-bearing electric motor, this ¼-in. drill features a Jacobs geared chuck, a Cutler-Hammer lock-action trigger switch, and a pistol-grip handle. Aluminum casting keeps the drill's weight down to 3 lb.—**Fairchild Industries, Burlington, Vt.**

PLASTIC CEMENT—A new cement reputed to be the nearest thing yet developed to a universal cement for stucco work, adapting well to scratch, brown and finish coats, has recently been produced. The cement is reported to carry up to 40 shovels of sand per sack without losing any of its characteristics of easy workability.—**Calaveras Cement Co., San Andreas, Calif.**



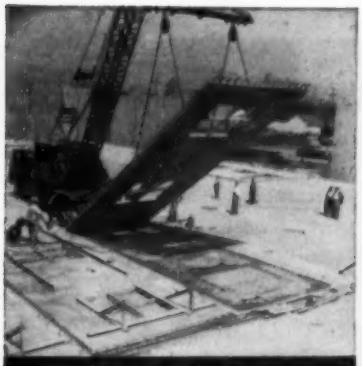
WALL PANELS—American Pan-L-Wall is an economical lightweight sidewall, available in aluminum, steel, stainless steel, rigidized metal, aluminized steel or fire-resistant asbestos-protected metal wall. According to the manufacturer, the wall panel has an insulation efficiency rating up to three times that of an 8-in. brick wall. Construction costs are claimed to be far lower than masonry. All interior surfaces are protected against corrosion and discoloration caused by electrolytic action and against deterioration from condensation.—**American Steel Band Co., Box 565, Pittsburgh 30, Pa.**

SWIVEL LOCK CASTERS—A new four-position, plunger-type swivel lock which prevents swivelling or rolling of casters supporting staging, scaffolding or heavy equipment is now available on 6-, 8- and 10-in. sizes of Bassick S99 series heavy-duty casters. The new device permits locking of the caster swivel at 90-deg increments, keeping the structure it supports firm and steady. When unlocked, full 360-deg swivelling is possible.—**The Bassick Co., Bridgeport 2, Conn.**

TUBE SOLDERING TOOL—A new tool for soldering copper tubing is No. 10554 plumbers' portable soldering set. Consisting of an all-electric plier soldering device in conjunction with Wassco's No. 105-C2 1000-w portable power unit, this equipment features safety and ease where there is no open flame, burn or fire hazard. It operates from the nearest power outlet, eliminates gas supply problems and is fast to rig and start work. The unit is used primarily for soldering copper tubing "sweat" fittings up to 1½-in. size. However, it also works on heavy electrical wire and cable. Its advantages include easy portability, a pocket in the case for pliers and leads, convenient push-button heat control in the plier handle, and 10-ft leads. It will solder ½-in. OD tubing fittings reliably tight in 20 sec. **—Wassco Electric Products Co., Joliet, Ill.**

AJUSTRITE STOOL—A new sit-stand-lean stool offers a way to give employees with shop- or office-type jobs a quick easy way to relief. No tools of any kind are required to make adjustments from a stool low enough to sit on to a high leaning-type support. **—Ajusto Equipment Co., 2144 Madison Ave., Toledo 2, Ohio.**

PLASTIC PANEL—A remarkable improvement in translucent building panels—now reinforced with Fiberglas and Nylon—is called "Filon." This is the first time that Nylon, in the form of parallel strands, has been combined with Fiberglas to provide substantially greater strength in plastic panels. The parallel Nylon strands give more rigidity and greater resistance to heavy loads and impacts. Actual tests have shown that an 8 oz. per sq ft Filon panel can support a load of more than 200 lb per sq ft, on a 4-ft unsupported span. This is double the required standards of the U.S. Army and Navy. In addition to all standard sizes, any length sheets for special applications can be supplied. The only limitation is convenience in handling. For many installations, the longer than standard lengths can eliminate end laps, resulting in a savings of labor and better appearance. Filon is now produced in 20 colors, in crinkled and smooth finishes, and in 6 and 8 oz weights. The added strength and shatterproof qualities provide an extra measure of safety when used in shower doors, tub enclosures, partitions and other installations.**—Plexolite Corp., 2051 E. Maple Ave., El Segundo, Calif.**



PRECAST PANEL 32' high, 18½' wide with two large window areas.

TRUSS has 60' span at top

114,000 LB. SLAB being positioned

PANEL with door and two window areas

SUPERIOR

Complete Accessories Plus Experience on Tilt-Up Jobs!

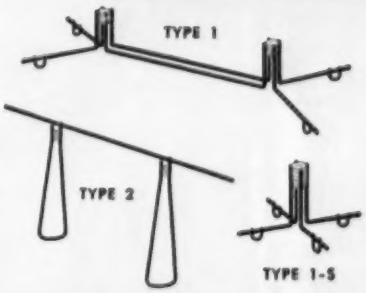
On every Tilt-Up job the proper type of Pick-Up Inserts and Brace Anchors as well as their location in the slab or precast structural member are of prime importance in order to withstand the stresses occurring when *tilting*, *lifting*, and *positioning*. As pioneers in this field, SUPERIOR has developed various types of accessories and correct procedures resulting from the experience of thousands of job applications.

SUPERIOR accessories are designed for fast and efficient handling of all types of precast panels and structural members. The Pick-Up Insert provides dependable anchorage for bolts which secure a lifting angle to which slings are attached when the panel is raised. Brace Anchors secure the temporary bolts by which the Braces are attached. The exclusive pivoting action of the adjustable Braces permits quick positioning and alignment of panels. Braces are assembled with 2 x 4's or pipe of lengths to fit job conditions.

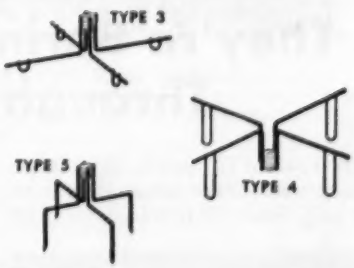
The many types of SUPERIOR Inserts, Anchors, and Braces for every job condition together with complete layout service provide a combination which offers safe and efficient handling of precast panels and structural members.

For complete details request a copy of BULLETIN TU-2.

PICK-UP INSERTS



ANCHORS for BRACES



BRACES

SUPERIOR CONCRETE ACCESSORIES, INC.

4110 Wrightwood Avenue, Chicago 39, Illinois

New York Office
1775 Broadway, New York 19, N. Y.

Pacific Coast Plant
2100 Williams St., San Leandro, Calif.

Bethlehem Hollow Drill Steel is giving good service as Tonawanda's water-intake tunnel is bored through solid rock beneath the Niagara River. *General Contractor:* Herbert F. Darling, Williamsville, N. Y.; *Consulting Engineers:* Nussbaumer, Clarke & Velzy, Inc., Buffalo, N. Y.

They're Boring Water-Intake Tunnel Through Rock Beneath Niagara River

The Town of Tonawanda, N. Y., is boring a water-intake tunnel, some 6,000 ft long, about 100 ft beneath the swirling waters of the Niagara River. The tunnel, 7 ft high and 7 ft wide, will be part of Tonawanda's new municipal water system, expected to be in operation late in 1955.

Closeup of Bethlehem roof bolts, used in tunnel with square plates and longitudinal ties to prevent rock falls. These long bolts are driven deep for firm anchorage.

Construction of the tunnel calls for the removal of 9,200 cu yd of rock, most of it medium-hard limestone. Using drills with air-leg mountings, and making exclusive use of 1-in. hexagon Hollow Drill Steel, fitted with carbide bits, the contractors are drilling blast holes 6 ft deep. The total footage drilled is expected to be in the neighborhood of 130,000 lineal ft.

Wherever there's rock to be moved, you can count on satisfactory service from Bethlehem Hollow Drill Steel. This is because Bethlehem Hollow is rolled from a tough, fatigue-resisting steel. It has a wide quenching range. It's easy to heat-treat for the ideal balance of hardness and wear-resistance. It also makes long-wearing threads and tough shanks.

Bethlehem Hollow Drill comes in rounds, hexagons and quarter octagons, usually in lengths of 18 to 25 ft. Longer lengths can be furnished to meet special requirements. It's good, sound drill steel — and it can hold drilling costs to the minimum in any job you name!

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

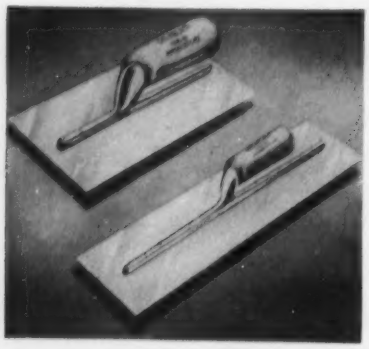
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM HOLLOW DRILL STEEL

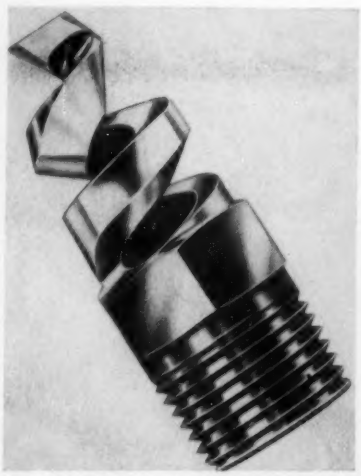
BETHLEHEM STEEL

ELECTRIC CHAIN HOIST—The CM Lodestar is designed to serve for its normal life without maintenance. It also features shock-proof push-button control, sealed-in lifetime lubrication, self-adjusting heavy-duty brake, overload protection, fully enclosed and protected components, safety limit switches, light weight, and extremely compact size and low headroom. A unique jam-proof chain guide and non-kinking flexible link "CM-Alloy" chain permit the Lodestar to be used for extreme angle pulling. The single phase model (without contactor) can be used for side pulling. It can also be used upside down for odd jobs where it is inconvenient to install a hoist overhead. Used this way, the Lodestar "lifts itself with the load." Interchangeable suspensions are another interesting Lodestar feature. All swivel or rigid hooks and lugs, and adapters are interchangeable on all models. Available in capacities from ⅛ to 1 ton for operation on single-phase 115-v and three-phase 208-220/440-v 60-cycle power. The three-phase models are factory wired for 220 and 440-v and can be converted from one to the other in minutes. The ¼-ton model weighs only 51 lb. **—Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp. Tonawanda, N.Y.**

SMALL TORQUE CONVERTOR—Fluomatic, a small torque convertor for gasoline or electric motors under 10 hp, eliminates shock starting or stopping, according to the manufacturer. It is stated further that it is applicable to screw conveyors, winches, hoisting devices, and numerous other machines. Used with gasoline motors, it allows the engine to assume full speed and hp regardless of load. Used with a multiple bank of electric motors, it eliminates the need for electronic synchronization. Completely contained the unit weighs 27½ lb. **— Little Beaver Industries, Willoughby, Ohio.**

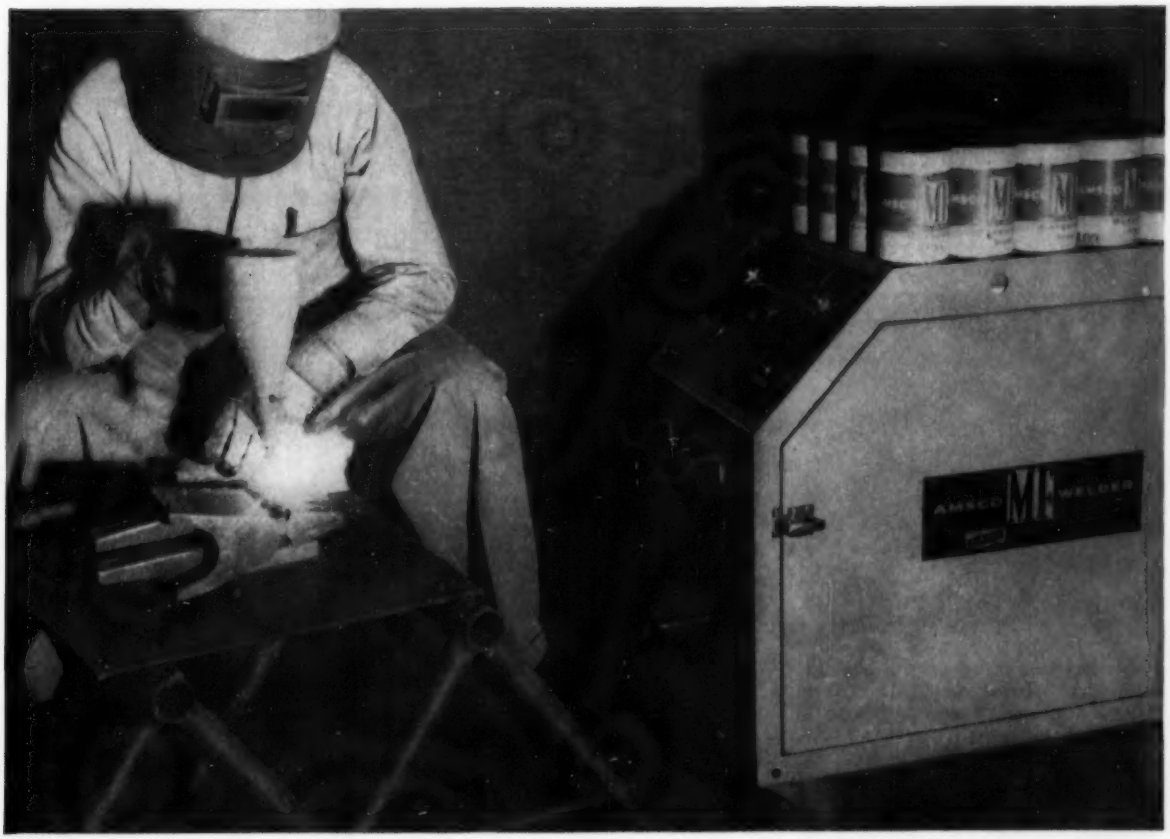


STEEL TROWELS—A line of steel trowels manufactured from a flexible stainless steel alloy has several advantages over the usual line of steel trowels, according to the manufacturer. The nature of this alloy makes the trowels more resistant to rust, abrasion, staining, pitting and wear in general. Also claimed is increased resistance to corrosive agents such as magnesite and Hubelite. The trowels are the same weight as other steel plastering trowels. Offered in two sizes, 14x14 and 10½x4½ in.—**Goldblatt Tool Co., 1960 Walnut St., Kansas City 8, Mo.**



FOG NOZZLES — Called the Bete TU-CONE N series, these new nozzles are claimed to combine low cost with the advantages of high resistance to clogging, simplicity of design, long reach of the fog pattern and uniform atomization. The nozzles employ two spiral turns, producing an inner and outer cone which results in uniform coverage over a 90-deg. cone. They are made from one small piece of ⅞-in. hex metal and have no internal parts. It is claimed that particles in the spray smaller than the orifice will pass freely through the nozzle without clogging. Atomization is claimed to be superior to that of whirl or other conventional nozzles. The nozzles are made with ½-in. male pipe thread in brass or stainless steel, and are available in five models with flow rates from 5 to 50 gpm. The over-all length is 2½ in.—**Bete Fog Nozzles, Inc., 309 Wells St., Greenfield, Mass.**

WELDING ROD—A new welding electrode with a Ferromolostic (special powdered iron) coating, known as Nicol-Rod No. 99, alloys pure nickel with iron to produce dense, high strength, machinable welds in gray, malleable and ductile cast irons. Its outstanding advantage is the ease with which welds can be made. The arc is self-starting, and the rod re-ignites without freezing to the work. A softer, more stable arc is obtained with ac or dc, straight or reverse polarity. Of particular importance is that the arc is more stable on low, open circuit voltages. Field tests show that sound, machinable welds can be produced in all cast irons, even those that are old, grease-soaked or corroded. Of primary interest is that the welds produced have a minimum coefficient of expansion and contraction which ends cracking during cooling. The weld metal forms a positive bond and is softer, but of greater strength than the cast iron.—**Marquette Manufacturing Co., Inc., 307 E. Hennepin Avenue, Dept. NS, Minneapolis, Minn.**



Welder is shown welding a "wear-sharp" repointer to the shank of a dipper tooth using the Amsco MF and flux.

HARDFACE WITH THE AMSCO® MF

for manual flexibility . . . plus machine speed and accuracy

The Amsco MF combines the visibility and craftsmanship of hand welding with the automatic advantages of machine work. Speed of hardfacing increases because the Amsco MF uses small-diameter electrode and high-current densities which allow the operator to maintain a high deposit rate. The electrode feed is continuous—and automatically regulated—to maintain a constant arc. Thus, the machine automatically *compensates* for operator movement or an irregular welding surface.

Cost of deposited metal is less! The Amsco MF uses coiled, bare mild steel electrode. It feeds through the flux hopper (the cone). There it is magnetically coated with your choice of manganese steel build-up or hardfacing alloy which is carried in the flux. You coat your electrode as you weld at considerable savings in deposit cost.

The machine is portable. It plugs into any standard welding unit, and requires no special setup. See a demonstration of the Amsco MF's speed, quality of weld and uniform deposit. Try it yourself and discover how easy it is to operate. Your Amsco Distributor is ready to show it to you now. Welding products are distributed in Canada by Canadian Liquid Air Co., Ltd.

make your Amsco Distributor HARDFACING HEADQUARTERS

AMERICAN Brake Shoe COMPANY

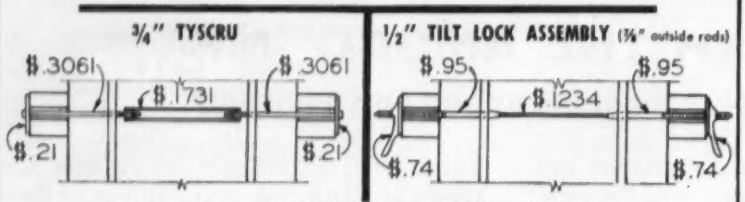
AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Ill.

48th Street Twin-Arch Bridge on Queen's Midtown Expressway; contractors: Gall Contracting Company, Inc. Inset: Herbert E. Smith, superintendent

Richmond Study Points Way To Concreting Economies

Although the various methods of form tying affect both the cost and quality of concrete form work, little has been published on this subject. The purpose of this Richmond study was to analyze the relative merits of the two methods principally used today for tying medium and heavy concrete forms — Tyscrus and Tilt Locks. The results of this analysis — as the following excerpted data shows — disclose that one of these methods has much to recommend it over the other. Richmond Screw Anchor Company makes both products, so there can be no question of bias in the presentation.

Comparative Analysis of Form-Tying Methods for Medium and Heavy Concrete Work*



Items used for each tie, their cost and freight weight

1—¾ x 10" Tyscru	$ .1731	.87 lbs.	1—⅜ x 10" Threaded Rod	$ .1234	.44 lbs.
2—¾ x 15" Tylags @ .3061	.6122	4.1 lbs.	2—20" Outside Rods @ .95	1.90	6. lbs
2—4½ x 5 x ⅛" Flat Washers @ .21	.42	4 lbs.	2—5" dia. Clamps @ .74	1.48	4. lbs.
	$1.2053	8.97 lbs.		$3.5034	10.44 lbs.
Less 90% Credit on return of Working Parts	.9290		No return of Working Parts	0.00	
	$ .2763			$3.5034	

Analysis of use cost, per tie, based on 20 re-uses of working parts

Tyscru	$ .1731	Threaded Rod	$ .1234
1/20th Working Part Cost	.0052	1/20th Working Part Cost	.17
	$ .1783		$ .2934
Plus freight to the job on and return freight on	8.97 lbs. 8.1 lbs.	Plus one way freight on	10.44 lbs

Steps involved in installation of each type

No pre-assembly required	Must be preassembled by screwing inside rod into female ends of the outside rods, 20 turns for each end. Assembled rods are pushed through holes in both sides of the form. Clamps are slid on outside rods, up to the wales and then turned three turns each to lock in place.
Flat Washer is placed on Tylag. Tylag inserted in hole in the form and screwed into coil of the Tyscru 7 or 8 turns for each Tylag	
HANDLING 4.13 lbs. per tie	HANDLING 9.81 lbs. per tie
Thread of Tylag visible beyond coil assuring full strength	Thread of Inside Rod concealed in end of Outside Rod. No way of checking to be sure how far it is threaded in.
In stripping Tylag is backed out of each side of the form.	In stripping Clamps are unseated by backing off three turns then sliding off the rods. Using the clamp as a wrench the outside rods are then turned out of the holes.

*Facts shown here based on 12" wall, safe load of ties 9,000 lbs.

Equally important are three additional facts which the analysis, by its nature, does not bring out:

1) The actual mechanical operation of putting a Tilt Lock Assembly together is much more time-consuming than is the Tyscru operation.
2) There is only one threaded connection with the Tyscru. The thread is coarse and the Tylag thread, being buried in the concrete, is self-cleaning when it is removed. The outside threads on the Tilt Lock Rods are subject to becoming scoured up by spillage of concrete and require cleaning.
3) The Tyscru System can be readily equipped with Tycones as spreaders, if desired, which cannot readily be done with a Tilt Lock System.

By the nature of the Tyscru operation, Richmond Tyscrus produce more accurate form work. Tyscru Systems are planned for individual jobs and special requirements are on hand at the job as required. The threaded rods, when produced on the job, often are not available as needed and are costly to produce. When ordered from the manufacturer, they usually are furnished as fill-ins and so often do not fit the needs of the job and run up the cost.

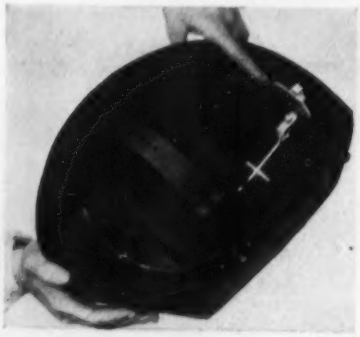
CONCLUSION: The Richmond Tyscru System effects great savings, in time, labor and cost, over the Tilt Lock System.

On all your medium and heavy construction work, Richmond Tyscrus will also give you extra strength. The published ultimate strength of the Tyscru described above is 16,000 lbs., that of the Tilt Lock Assembly 12,000 lbs.—both are sold for 9000 lbs. safe-load. Furthermore, repeated impartial tests on all sizes of Tyscrus show that their *ultimate* strength far exceeds their *published* safe load. You can pour fast and heavy in all weather with these resistance-welded ties because they have extra strength built in.

Complete information on Richmond's Tyscru Systems is contained in the 1955 catalogue of Richmond-engineered Tying Devices. Write for your copy. If you have any specific problems, Richmond's Technical Division or field service men will be glad to submit recommendations, drawings and proposals. Write: RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Ave., Brooklyn 8, N. Y. or 315 South Fourth St., Saint Joseph, Mo.

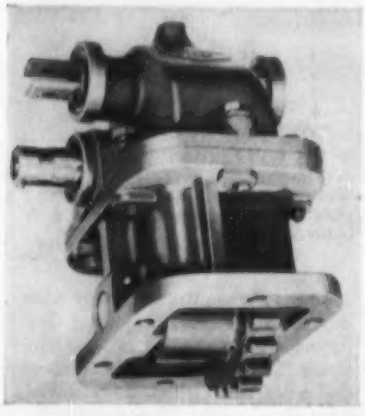
JACKSTAND — A new jackstand built for rugged work, will fit and lift the drawbar of any construction equipment. Lifting capacity is 2 tons. The whole unit stands 27 in. high on a 6-in. round, steel base plate, when in use. The unit will raise 5 in. All parts except the base are cadmium plated for extra weather protection. **—Knight Mfg. Co., Broadhead, Wis.**

STEELOC SLINGS—Steeloc is a new wire-rope locking device that enables slings to be made without expensive hand splicing, yet have a strength greater than hand splicing. The sling is formed by looping back the end of the rope and laying it beside the main rope body. The locking sleeve, of ductile, heat-treated steel, slides over the two ropes until all the end strands are securely encased. Then the lock is placed in a precision die, and hydraulic pressure up to 1,000,000 lb is applied. The metal of the lock flows into the valleys and strands of the rope and places all strands under compression. All loose strands are covered by the lock, preventing injury, fraying and burrs. By using heat-treated steel the manufacturer has matched the hardness of the rope. Steel grips steel where softer metals would be cut and drawn. The steel withstands use and abuse better than softer metals. All hand splicing is eliminated, and a great many slings can be produced each hour. Can be applied to all constructions of Yellow Strand wire rope and is a neat, safe, low cost means of putting a loop or fitting in the end of a wire rope. Slings of rope up to 1 in. can be formed with the new process, and all types of fittings, attachments and handling devices can be applied with Steeloc.—**Broderick & Bascom Rope Co., 4203 Union Blvd., St. Louis 15, Mo.**

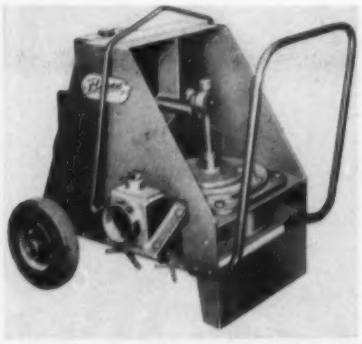


WELDING HELMET—A new type welding helmet, Chin-Lense, frees both hands for welding at all times by permitting the operator to raise or lower the welding lens with a slight pressure of the chin. Flashproof, spatterproof and leakproof, the compact helmet weighs no more than conventional helmets, is comfortable and easy to wear and adjusts to fit any welder.—**Carruthers and Fernandez, Inc., New Products Div., 1501 Colorado, Santa Monica, Calif.**

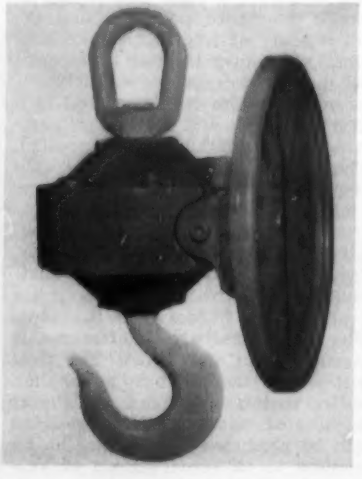
MASONRY SAW BLADES — The new Polk-a-Dot break-resistant saw blades for masonry cutting has just been announced by Clipper Mfg. Co. The name "Polk-a-Dots" comes from the fact that both sides of the blades are symmetrically covered with raised abrasive dots each acting as an extra cutting edge. The blade runs cooler and smoother and is reinforced out to the cutting edge with glass-fiber webbing with extra reinforcing on both sides of the blade at the hub.—**Clipper Mfg. Co., Dept. 631, 2800 Warwick, Kansas City 8, Mo.**



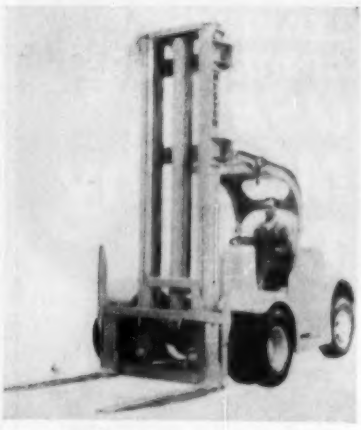
POWER TAKEOFF — A new medium-duty two-gear single speed Spicer power take-off adaptable to applications such as pump operation, pulling cables, dump-body work, and other intermittent operation jobs is available in two models, FA and FB. Both models will attach to transmissions with standard SAE openings using six pitch gears, and are available with or without cable control.—**Dana Corp., Toledo 1, Ohio.**



DIAPHRAGM PUMP—Weighing only 235 lb, the BC-302 is easily handled by two men. It has both a handle for portability, and a lifting bail for mechanical loading. Of cast-iron construction it is semi-enclosed for exterior protection. It has a standard No. 3 diaphragm, and valves are free-opening rubber-faced swing type. The pump shaft crank pin and pump connection rods have roller bearings, and bearings are lubricated by handy grease cups. Specifications show 3-in. suction and discharge, a capacity of 3,600 gal per hr at 10-ft of head, and a maximum suction lift and discharge head of 25 ft. Powered by a Briggs & Stratton SR6 1.8-hp single-cylinder, air-cooled gasoline engine. It is also available with a 1.5-hp gear-head electric motor. The unit is mounted on two 10-x2.50-in. rubber-tired wheels. Over-all height is 30 in., width 28 in., and length 34 in. Readily adaptable for mounting on tank trucks.—**Barnes Mfg. Co., Mansfield, Ohio.**



HOOK SCALE—The Martin-Decker SU-20 Sensator is a hydraulically operated hook scale that has a guaranteed accuracy of ¼ of 1% of capacity at any point on the dial. It is available in three capacities—5,000, 10,000, and 20,000 lb.—**Martin-Decker Corp., 3431 Cherry Ave., Long Beach, Calif.**



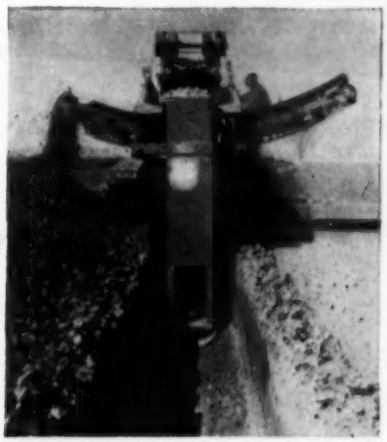
NEW LIFT TRUCK—The RT-120 of 12,000-lb capacity and weighing 14,600 lb incorporates Hyster's overhead tilting mechanism said to reduce stress in the frame and tilt mechanism. Standard lift height of the model is 17 ft 6 in. Optional heights are available ranging from 8 ft 2 in. to 24 ft. Outside turning radius is 180 in. Over-all width and wheelbase length both measure 86 in. The lift truck's maximum speed is more than 19 mph in either forward or reverse. A 6-cyl International Harvester engine and heavy-duty, 7:50x15, 10-ply tires are featured.—**The Hyster Co., 2902 N. E. Clackamas Street, Portland 8, Ore.**

CONCRETE FINISHER—Fitted with balanced retractable wheels for portability about the job, the new Champion finisher is so engineered that one man can move it from place to place. In addition, a new positive action clutch has been added which engages power smoothly without bucking or grabbing. The finisher is available in three sizes, 29-, 36-, and 48-in. diameters. A free-floating drive base has been designed to give accurate pitch adjustments both to floating and finishing trowels. The finisher comes equipped with one set of finishing trowels.—**The Champion Mfg. Co., 2028 Washington Ave., St. Louis 3, Mo.**

BRAND NEW

Completely Different...

BUCKEYE 308



. . . Here's the first of Buckeye's new "O" series ditchers — a pipeline and utility model that will outperform, point for point, any machine in its class! . . . Check the features listed below — then let your dealer show you how its heavy-duty construction, its rugged new Buckeye designed transmission, its new engine options and a host of other features make tough going easy — and put the new '308' definitely on top *by any standard of comparison in the pipeline or utility field.*

LOADED WITH EXCLUSIVE FEATURES!

HYDRAULIC CONVEYOR DRIVE . . . is completely controllable from operator's seat. Provides forward or reverse belt drive in a selection of 3 speeds to meet any conveyor need. Eliminates the shock damage normally found when driven mechanically from digging wheel drive — no complicated mechanical units!

LIVE HYDRAULIC WHEEL HOIST . . . for fast, accurate positioning of digging wheel independent of all other functions. Hoist operated by simple, one-hand controls from operator's seat.

TRACTOR-TYPE CRAWLERS . . . allow variation in tread width and bearing area thru selection of tread pads to suit any type digging. Idler rollers have face-type seals for longer crawler life.

SIMPLIFIED GROUP CONTROLS . . . with panel mounted conveyor and hoist controls, foot operated steering controls. All controls need only light pressures, are within easy reach of operator. Control arrangement simplifies use by experienced operators — speeds "breaking-in" time of new operators.

STREAMLINED UNIT DESIGN . . . plus standardized unit construction give both a neat, compact design and interchangeability of major components and assemblies with other new series "O" Buckeye ditchers to be announced very soon

HEAVY DUTY DIGGING CAPACITY . . . digs to 5' 6" deep with optional cutting widths from 16 to 32 inches, in 2 in. steps.

No. 5521

GAR WOOD INDUSTRIES, INC.

WAYNE, MICHIGAN

Outperforms any machine in its class!

New PUBLICATIONS From MANUFACTURERS

The catalogs and bulletins reviewed below will keep you posted on latest developments in construction equipment and materials available for your use.

BLACKTOP TREATMENT—Jennite J-16 is recommended for the protection and preservation of blacktop pavements in a recently published bulletin of **Maintenance, Inc., Wooster, Ohio.** Applied in a liquid coating over new or old surfaces to form a waterproof finish, it is said to protect against frost damage, abrasion, oxidation, solvent action of oil and gasoline and the drying effects of the sun. It is recommended for use on driveways, roads, parking lots, etc. Because it resists heat, it will not run or flow at any temperature. Easily applied by brush, squeegee or distributor, it is reputed to double the effective service life of asphaltic pavements.

WATER HEATER—A new 8-p catalog issued by **Ruud Mfg. Co., 2025 Factory St., Kalamazoo 24F, Mich.** The catalog, RS 100A, explains how specific Ruud automatic gas water heaters may be quickly matched to specific hot-water needs. A chart in the booklet prescribes the correct heater for the tvpe of establishment served, the condition of the water —whether hard or soft, corrosive or non-corrosive, the temperature range requirements, and the recovery rate needed. Photographic and factual descriptions are given of each of 12 commercial models, including automatic storage, circulating tank and instantaneous gas water heaters. Construction specifications, application details, control data, approval specifications and space requirements are listed.

TRUCK SHOVEL—Six-page bulletin describes and illustrates the construction and capacities of the Quick-Way ½-cu yd Model L-2. Digging ranges and ratings are listed and illustrated by charts. In addition, the bulletin includes the specifications of the new Quick-Way crane carrier.—**The "Quick-Way" Truck Shovel Co., Box 1800, Denver, Colo.**

TRACTOR ATTACHMENTS — "9 Profitable Minutes for Contractors" is the title of a new brochure which outlines methods of increasing productivity through the use of Hyster job attachments on either new or used tractors. It is prepared from on-the-job case histories. Pictured are many different Hyster attachments, including the Hystaway excavator crane, grid roller and Hyster donkeys, yarders and winches.—**Hyster Co., 2902 N. E. Clackamas St., Portland 8, Ore.**

ELIMINATING STREAM POLLUTION FOR A GREATER AMERICA

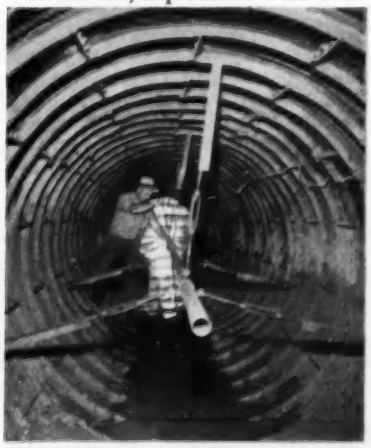
LOOKING DOWN vertical shaft to tunnel driven 33 feet under six-lane highway. Unaffected by weather conditions, men work around the clock in tunnel headings. Steel plates line shaft and tunnels, protecting men against cave-in.

MINING IN TUNNEL progresses close to pay line. When 4 square feet of ground is exposed, man bolts next plate into ring.

How COMMERCIAL tunnel liner plates are a time and money saving answer in soft ground tunnel construction. . .

RAPID PROGRESS is being made in driving 8400 feet of tunnel at depths as low as 33 feet below the surface by Mountain State Construction Company for the Sanitary Board of the City of Charleston, W. Va. Tunnels 84″ and 68¾″ in diameter, when completed later this year, will become part of the project that will intercept and pick up existing sewage lines now dumping into the Kanawha and Elk Rivers and divert the flow of all raw sewage to a new disposal plant now under construction.

Several major problems were overcome when consulting engineers decided, and the contractor agreed, that the steel tunnel liner plate system was the ideal method to use in driving these tunnels. I.V. Cunningham, Owner of Mountain State, says that he is using 2,000,000 pounds of COMMERCIAL steel liner plates because simplicity of the COMMERCIAL system makes rapid progress possible even though tunnels are being driven close to the river in wet ground where cave-ins are a constant hazard and beneath Kanawha Boulevard where traffic continues uninterrupted on one of Charleston's busiest arteries.



CHECKING ALIGNMENT, Vernon Cunningham says, "Once the first few feet of tunnel liner plates are in place, the remaining rings are practically self-aligning."

Setting the proper ground support quickly as mining progresses in the heading of a soft ground tunnel is of utmost importance. COMMERCIAL liner plates are curved to the exact required radius and because of their size, weight and design, one man can easily and quickly set them into place. Bolts are slipped through matching holes punched in the four inside flanges of the plates and nuts tighten up quickly with the use of only a spud wrench. There is nothing awkward in bolting the COMMERCIAL plate into place because everything is out in the open and you see just what you are doing.

Starting this contract with unskilled workmen, Mountain State has found that it worked out perfectly to let their men learn the COMMERCIAL liner plate system on the job, and in short order the crews performed as teams. With actual physical labor reduced to a minimum and the fear of cave-in hazards negated, Vernon Cunningham says, "They are happier workers than any I have seen in all my years in the construction business. This, of course, pays off in results. For my own part, I have found the COMMERCIAL liners a time and money saving answer to a difficult construction problem."

REMOVING MUCK from heading places additional load of 1500 pounds on monorail system suspended from steel liner plate lining.

Can we be of assistance to you on your next tunnel job? There's no obligation.

THE COMMERCIAL SHEARING AND STAMPING COMPANY
Youngstown, Ohio Chicago, Illinois Salt Lake City, Utah

COMMERCIAL
shearing and stamping

HARD HATS—A complete line of Skullgard protective helmets is described in a recently published booklet (No. 0600-3). In addition to informative material on the importance of head protection, the 16-p brochure contains descriptions of all models of MSA Skullgards and their applications. Copies may be obtained from **Mine Safety Appliances Co., 201 N. Braddock Ave., Pittsburgh 8, Pa.**

PAVING ACCESSORIES — A new catalog on Sealtight paving products covers asphalt expansion joints, cork-fill expansion joints, fiber expansion joints, center strip, dummy joints, concrete curing compounds, subgrade paper, base plate, rubber asphalt joint seal, sewer joint compounds and road-marking paints. This catalog not only contains all of the general information on each product (physical properties, sizes and thicknesses, installation information, etc.), but also a standard specifications section that explains what specifications each product meets.—**W. R. Meadows, Inc., Dept. PP, Elgin, Ill.**

TRUCK EQUIPMENT—A new 4-p illustrated bulletin covers the entire Heil line of dump bodies, twin-arm hoists, lightweight telescopic hoists, conversion hoists, rock bodies and hydraulically elevating truck tailgates. Photographs, specifications and descriptive copy fully cover each of the units. Bulletin BH-54120, is available from the **Heil Co, Milwaukee 1, Wis.**

WROUGHT IRON PIPE—A 52-p manual containing the technical information most frequently required by contractors and other specifiers of pipe and tubing has just been released by the **A. M. Byers Co., Pittsburgh, Pa.** Data is also provided about wire and sheet metal gages, water flow in gpm and other useful data. Individual tables include size and dimensional data for standard pipe, extra-strong and double extra-strong pipe, other special pipe series, fittings, etc. Supplementing the tables is a section on the specifications, identifying markings and mill standards and specifications for wrought iron.

PUMP BULLETIN—A new Bulletin, No. C-1054, describes Wheeler-Economy two-stage type DMD pumps. Construction features are illustrated, including dimension tables for various pump sizes. DMD two-stage pumps find general acceptance where head requirements exceed single-stage pump capabilities. Designed in sizes from 2- to 10-in. discharge for capacities to 4,000 gpm and for heads to 750 ft, they are highly efficient, compact, rugged and serviceable units.—**C. H. Wheeler Manufacturing Co., Economy Pumps Div., 19th and Lehigh, Philadelphia 32, Pa.**

HOW TO BUY CONVEYOR BELTS

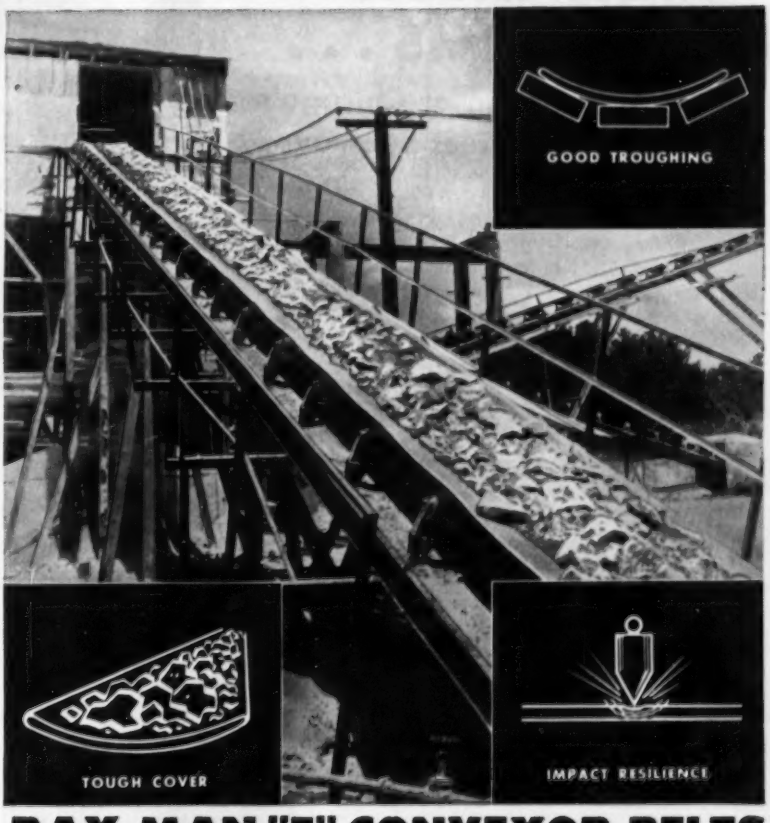
FOR FULL LOADS ON UNEVEN RUNS

...and get "More Use per Dollar"

Look for a belt with engineered features that assure maximum troughability, resistance to gouging, tearing or ripping, and dependable fastener-holding qualities.

Good troughing is the first thing to look for in an efficient, straight running conveyor belt on up and down grades. To trough properly, a belt must have full freedom and flexibility to make adequate contact with the center rollers. Conventional duck belting strong enough to handle the heaviest loads is stiff and "boardy", does not trough readily and consequently causes load spillage . . . especially where belts must follow uneven contours, as in mining operations.

Specify by name the one belt specially built to resist gouging and tearing, to trough deep and carry a full load regardless of the ups and downs of the run . . . specify Ray-Man "F" Conveyor Belts.



RAY-MAN "F" CONVEYOR BELTS

The elastic nature of special strength members and synthetic outer plies (both top and bottom) give Ray-Man "F" Conveyor Belts unusual crosswise flexibility to trough easier. It permits deep loads in narrow widths and has exceptional flexibility around small pulleys for low head-room operations. It requires no breaker strip, yet resists gouging, tearing and ripping better than other constructions and holds fasteners under severe operating conditions.

Let an R/M representative show you the advantages of Ray-Man "F" as well as other R/M feature conveyor belts . . . Homocord, with extra cushion for shock loading . . . Ray-Man Tension-Master for long lifts and high tensions. R/M heavy duty conveyor belts have the exclusive "XDC" Cover that greatly prolongs belt life with its extra protection against wear, tear, cuts and abrasion . . . gives "More Use per Dollar".

RR 501-A6

MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings
Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Bowling Balls

STUD WELDING—Twelve of the most commonly used arc welding stud, pin and pad design specifications are included in a 16-p booklet recently issued by **KSM Products, Inc., Merchantville 8, N. J.** A review of stud-welding equipment and details on the use of various studs is included, along with 12 pp of stud design specifications. An important feature of each specification is the introduction of a simplified method of ordering. Market analysis, mechanical properties, thread sizes, plating and annealing information are also supplied.

ASPHALT PAVER—The Adnun Jr. 8, is the subject of Bulletin No. 2609 which is equipped with a 12-hp motor for maneuvering the empty paver and for supplying power to the oscillating screed and rotating breaker bar. Hopper capacity of the machine is approximately 2 tons. It will pave an 8-ft strip. — **Construction Equipment Div., Blaw-Knox Co., Pittsburgh 38, Pa.**

STRUCTURAL LAMINATES—Lamicor, a new structural material combining unique thermal, electrical, chemical and mechanical properties, is fully described in an illustrated folder just released by **Strick Plastics Corp., Philadelphia, Pa.** A lightweight polyester, its manufacturers claim strength superior to steel, weight lighter than aluminum, thermal insulation, electrical insulation, dimensional stability and resistance to corrosion. Eight typical applications are described: tank linings, laboratory work tables, exhaust ducts, marine applications, templets, partitions, commercial refrigerators, electronics structures. The folder also includes a complete table of technical specifications.

CLOSURE STRIPS—A new 12-p catalog describes the expanded line of Fabco closures for sealing openings in corrugated coverings. Profusely illustrated, the catalog includes tables of the various closure materials of both rubber and asphalt composition. Also included are a number of typical detail drawings.—**Fabricated Products Co., Water St., West Newton, Pa.**

LE ROI COMPRESSORS—A new 12-p catalog just issued by **Le Roi Division of Westinghouse Air Brake Co., 1706 S. 68th St., Milwaukee 14, Wis.** No. CG-9A, pictures all 40 available models of portable-type compressors. The included quick reference chart graphically shows the contractor capacities, engine types, and mountings. Also illustrated are the exclusive Airmaster features such as: replaceable cylinders, sleeves, interchangeable valve parts, aircraft type compressor cylinders, heavy-duty type industrial engines, and magneto ignition on all gasoline models.

DRAFTING EQUIPMENT — This catalog illustrates, describes and gives specifications for Stakmaster 4- and 5-drawer files, Multimaster tables, Planmaster sectional steel filing cabinets, Draftmaster drafting tables and accessories, Thriftmaster drafting tables, Tracemaster tracing tables, taborets and also X-ray film filing cabinets. The catalog is planned to give readers complete working knowledge of Stacor steel equipment and to show them how the various units are adaptable to specific business and industrial needs. — **Stacor Equipment Co., 768-778 E. New York Ave., Brooklyn 3, N.Y.**

FWD TRUCKS—Three new brochures describing FWD's 1955 series 100, 200 and 300 heavy-duty trucks, have just been published. Each brochure features a different series—100 for 14,500 and 17,500 lb gvw; 200 for 22,000 to 28,000 lb gvw, and the 300 for 32,000 to 36,000 lb gvw. Highlighted are greater driving power, increased load capacity and proportioned engine torque to weight on front and rear axles by means of the new FWD power-proportioning center differential. Complete specifications for each series are included. The publications, each 8 pp, may be obtained by writing to the Sales Promotion Department.—**Four Wheel Drive Auto Co., Clintonville, Wis.**

ROPEOLOGY — A new cable-type overhead conveyor system, an automatic safety device for scaffold workers, a remarkable test of tires, logging operations, handling steel bar stock, boat slings, and well drilling are all shown in new Ropeology Bulletin No. 554. Copies may be obtained by writing to **Macwhyte Co., Advertising Dept., Kenosha, Wis.**

CONCRETE VIBRATORS—A new bulletin, No. 551, has been issued by Vibro-Plus on their line of gasoline, electric and pneumatic concrete vibrators. All vibrators have rollgear heads that obtain 12,000 vibrations per min with a flexible shaft speed of 3,600 rpm.—**Vibro-Plus Products, Inc., Woodside, N. Y.**

SKID-SHOVEL — Described in a new catalog is the new International Drott Four-in-One Skid Shovel. Moving or standing still, the operator of a Four-in-One merely by placing the shovel selector in the desired position, can convert it into a bull-clam shovel, a bulldozer, a skid-shovel or a clamshell. In addition, the versatile Four-in-One may be used as a backhoe. The Four-in-One is designed for use with the International TD-6, TD-9 tractors. They hold ⅜ cu yd and 1¼ cu yd and have a lifting capacity of 3,000 and 4,000 cu yd respectively. Available from the **Drott Mfg. Co., Milwaukee, Wis.**

Transite Sewer Pipe provides these 4 basic economies

The engineer, the contractor and the taxpayer —all benefit when Transite® Pipe is used for sewer lines. Costs are cut in many ways—among them the four basic Sewer Pipe economies . . . in system design . . . in installation . . . in operation . . . in maintenance. If you make a quick run-through of the following condensed check list, chances are you will find savings which apply directly to your sewer system problems.

1. System Design

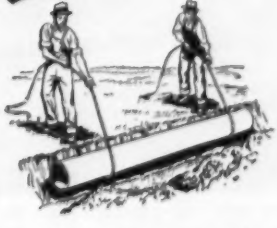
- Use of smaller diameter pipe
- Installation at flatter slopes

(Typical Economies)

- Installation in shallower trenches
- Savings in amount of material excavated
- Smaller earth loads
- Elimination of cradling
- Location of treatment plant at higher level
- Elimination of pumping

Users have found—With its high flow capacity (flow coefficient n= 0.010 derived from the Manning formula) and with its maintained strength, Transite Sewer Pipe contributes to typical system design economies.

2. Installation

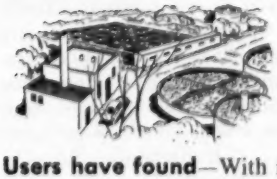


(Typical Economies)

- Fewer joints
- Easier handling
- Smaller crews
- Speedier assembly
- Assurance that joints pass severe infiltration tests

Users have found—With its longer lengths, light weight, ease of assembly and tight, quickly made joints, Transite Sewer Pipe contributes to typical installation economies.

3. Operation



(Typical Economies)

- Infiltration treatment cost drastically reduced
- Only normal sewage treated

Users have found—With its tight joints connected by Johns-Manville's Ring-Tite® Coupling, Transite Sewer Pipe contributes to typical operation economies.

4. Maintenance

(Typical Economies)

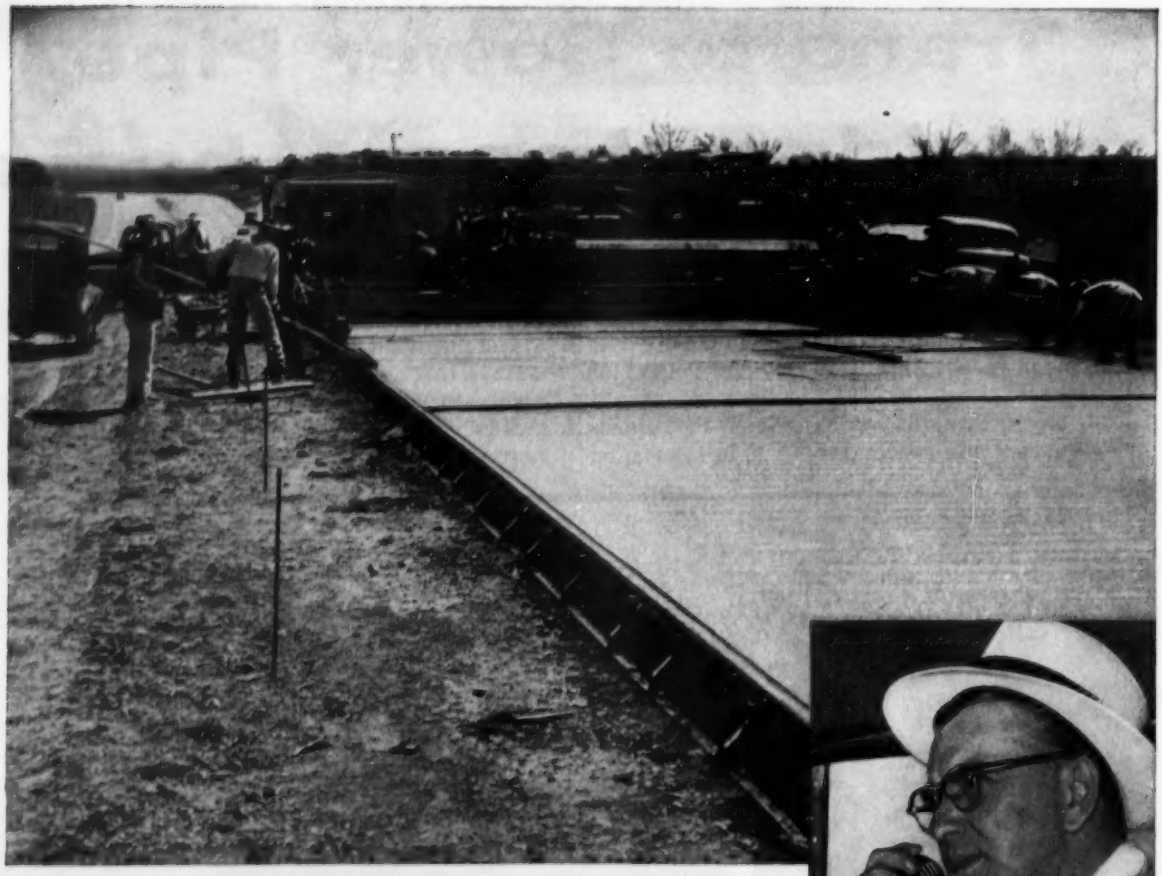
- Tree roots kept out—minimizes cleaning
- Sewers kept smooth and intact—pipe stays strong, joints stay resilient
- Need for frequent inspections reduced

Users have found—With its maintained strength and with its tight joints, Transite Sewer Pipe contributes to typical maintenance economies year after year.

For further information and your copy of TR-94A, helpful, widely used Sewer Design Flow Chart based on the Manning Formula, write Johns-Manville, Box 60, New York 16, New York

Johns-Manville TRANSITE SEWER PIPE

the asbestos-cement sewer pipe with the tight joints



7 REASONS FOR G-E 2-WAY RADIO

- ★ Control field operations
- ★ Save time
- ★ Increase efficiency
- ★ Cut idle time
- ★ Expedite and improve customer service
- ★ Coordinate vehicle dispatching
- ★ Lower costs

A superintendent maintains constant touch with construction headquarters via General Electric 2-way radio . . . and at the same time supervises numerous on-the-job operations.

2-WAY MOBILE RADIO

FREQUENCY STABILITY & SELECTIVITY
guaranteed for life!

THE importance of 2-way radio to you *for any reason* is actually a point in favor of selecting G-E equipment! Radio saves you money. Don't lose this money on an expensive-to-maintain communication system. Buy G-E! Its reputation for low cost maintenance requirements is widely respected throughout your industry! And, radio must perform on-the-job *at all times.* When it fails, your profit takes a beating! Superior G-E design . . . G-E components function to protect profit . . . provide always dependable performance. Select 2-way radio equipment carefully and know why G-E is preferred by leading companies in your business.

For additional details write to: *General Electric Co., Section X9865, Communications Equipment, Electronics Park, Syracuse, N.Y.*

Progress Is Our Most Important Product

GENERAL ELECTRIC

STAINLESS STEEL—A newly revised 24-p booklet entitled the "Joining of Crucible Rezistal Stainless Steels," describes in detail 17 methods of joining stainless steel by fusion processes which include manual, automatic, and semi-automatic welding, brazing, and soldering. The booklet also contains a section describing eight flame and arc-cutting procedures commonly used for severing stainless steel. — **Advertising Dept., Crucible Steel Co. of America, Box 88, Pittsburgh 30, Pa.**

TRIPLEX MOWER — An illustrated leaflet features the new Worthington Triplex, a three-gang, self-propelled mower and riding sulky built as an integral unit. — **The Worthington Mower Co., Stroudsburg, Pa.**

LIMA CRANES — Revised bulletins cover the Lima Type 34 and 44 power shovels, cranes, draglines and pull shovels on crawler and wheel mounts. Type 34 is a ¾-yd shovel and 20-ton crane on both crawler and wheel mount. Type 44 is a 1-yd shovel and 25-ton crane on both crawler and wheel mount.—**Baldwin-Lima-Hamilton Corp., Construction Equipment Division, Lima, Ohio.**

ESTIMATING GROUT — A handy pocket-size card for estimating grout requirements of heavy equipment, machinery, anchor bolts, building columns and bridge seats has just been released. Data is based on Embeco Pre-Mixed Grout, a ready-to-use, non-shrink grouting material that requires only mixing with water at the job site. The card lists Embeco Pre-Mixed Grout yield and estimating figures for one 100-lb. bag or pail, a cubic yard of flowable grout, and 100 sq. ft. of flowable grout 1 in. thick. The use of pea gravel in the grouting mix is discussed. On the reverse side, an easy four-point estimating procedure is given. Packaging and storage information is also presented. Copies available on request through **Master Builders Co., 7016 Euclid Ave., Cleveland 3, Ohio.**

LOW-COST EARTHMOVER—A new booklet titled "DW21 Low Cost Earthmover" contains contractors' reports on their experience with a unit that gives them low cost per yard over the entire life of the machine. Six contractors moving all kinds of material on various jobs tell why they're operating at a profit.— **Caterpillar Tractor Co., Peoria, Ill.**

CONCRETE PAVER—Specifications for the Model SD Blaw-Knox concrete paving spreader and vibrator are detailed in a new Bulletin No. 2485 which includes shots of the spreader at work on the New York Thruway, the Ohio Turnpike and other well-known construction jobs. — **Construction Equipment Div., Blaw-Knox Co., Pittsburgh 38, Pa.**

PROPER VIBRATION AND GOOD FORMS used in this well-planned box girder intersection make it easy to produce the best possible concrete. Good vibration technique is simple with good equipment, and . . .

Vibration Know-How Produces Better Concrete the Easy Way

One of the many ways experienced concrete foremen get maximum benefit from vibration is by planning concrete placement so each new dump is backed into a previous dump. This results in a smooth surface (no rock pockets) with maximum bond and greater strength. In the above photo the workman has just finished vibrating a dump at the center of a box girder intersection. As each succeeding dump is placed he will vibrate from the center outward, working it into concrete previously placed in the side members.

Appearance of sheen on the surface of the concrete gives visual indication that vibration is complete. With the modern high frequency vibrators pioneered by VIBER this requires only about 10 to 30 seconds, depending on the characteristics of the concrete.

• **Vibrator Operators** soon develop a "feel" which tells them the exact condition of concrete during vibration without seeing it. An experienced operator depends on this "feel" and the sound of his vibrator more than on the appearance of the concrete to tell him when vibration is completed.

Experienced operators describe the feel of concrete when the vibrator is first inserted as "rough" and "rocky." In a matter of seconds it "smooths out" and becomes "creamy," at which point vibration is complete and the unit may be removed from the concrete.

• **Good Forming** and proper vibration are essential where finished appearance is important, as it was on this overpass built by Erickson, Phillips, and Weisberg as part of the East Bay Freeway in Oakland, California. Tight forms made of well-seasoned lumber adequately braced can take full advantage of vibration to produce smooth, rock pocket-free concrete. VIBER'S replaceable rubber tipped vibrators are specially designed to prevent any damage to such forms, which might cause blemishes on the finished concrete surface.

• **For further information** on VIBER'S complete line of internal and external vibrators, contact your authorized distributor or VIBER COMPANY, 726 South Flower Street, Burbank, Calif., Dept. 75

VIBER

CONCRETE VIBRATORS SINCE 1931

SOME BIG CONTRACT AWARDS OF THE MONTH

Northlake Cement Co., 15 S. Wolf Road, North Lake City, Ill. 2,000 homes and shopping center near Palatine, Ill., for Midland Enterprizes, 2459 Peterson Road, Chicago, Ill. $30,000,000.

The McGraw Construction Co., Inc., First National Bank Bldg., Middletown, Ohio. Steel mill expansion and relocation of present wheel works at Butler, Pa., for Armco Steel Corp., 703 Curtis St., Middletown. $25,000,000.

George A. Fuller Co., 597 Madison Ave., New York 22. Roosevelt Field Shopping Center, Hempstead, N. Y., for Webb & Knapp, Inc., 270 Park Ave., New York 17. $23,000,000.

United Engineering & Constructors, Inc., 1401 Arch St., Philadelphia, Pa. Steel plant expansion at Ashland, Ky., for Armco Steel Corp., 730 Curtis St., Middletown, Ohio. $15,000,000.

B. Perini & Sons, Inc., 73 Montwait Ave., Framingham, Mass. Highway and bridge construction West Stockbridge, Stockbridge and Lee, Mass., for Massachusetts Turnpike Authority, 80 Boylston St., Boston. $10,317,533.

Turner Construction Co., 420 Lexington Ave., New York 17. Manufacturing plant at Merrimac Valley plant, 1600 Osgood St., North Andover, Mass., for Western Electric Co., 195 Broadway, New York City. $8,000,000.

Winkelman Construction Co. and **A. L. Dougherty,** Guaranty Bldg., Indianapolis, Ind. Contracts 1 and 2 East-West Toll Road, Lake County, for Indiana Toll Road Commission, 309 W. Washington St., Indianapolis 4, Ind. $6,762,531.

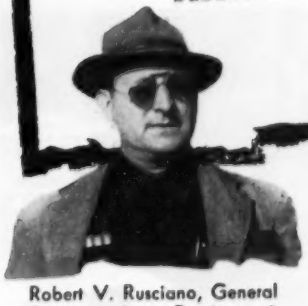
Peter Kiewit Co. & **Condon Cunningham Co.,** 15806 Lorain Ave., Cleveland, Ohio. Dual highway and bridges, East Chicago, to Hammond, Indiana East-West Toll Road, for Indiana Toll Road Commission, 309 W. Washington St., Indianapolis 4, Ind. $5,209,159.

Memo From: **ROBERT V. RUSCIANO, *New York Contractor**

Subject: **FAST DUMPING ATHEY PR21 TRAILERS**

"Athey PR21 is the fastest dumping trailer I've seen. Have used all kinds of high-speed hauling equipment and put Athey PR21's at the top for fast dumping and maneuverability. In fact, we now own six. That hydraulic jack arrangement takes the monkey business out of dumping. No complicated cables or controls. It dumps a full 31-ton load of sticky gumbo in less than 20 seconds, cutting at least 60 seconds off of the dumping time of other trailers we've used. We are using Athey Trailers and Cat Diesel Tractors on the New England Thruway where we're moving 160,000 yards of rock."

*(Rusciano & Son Corp. and Del Balso Construction Corp.)



Robert V. Rusciano, General Superintendent, Rusciano & Son Corp. and Del Balso Const. Corp., New York Contractors.

Check with your Athey - Cat Distributor for more information on Athey Trailers. He has all the facts and figures — see him soon, or write direct to Athey Products Corporation, 5631 West 65th Street, Chicago 38, Illinois.

Fast, clean dumping speeds production for Mr. Rusciano on his New England Thruway contract. He operates six Athey PR21 Trailer - Cat DW21 Tractor teams.

Athey APCOR Products

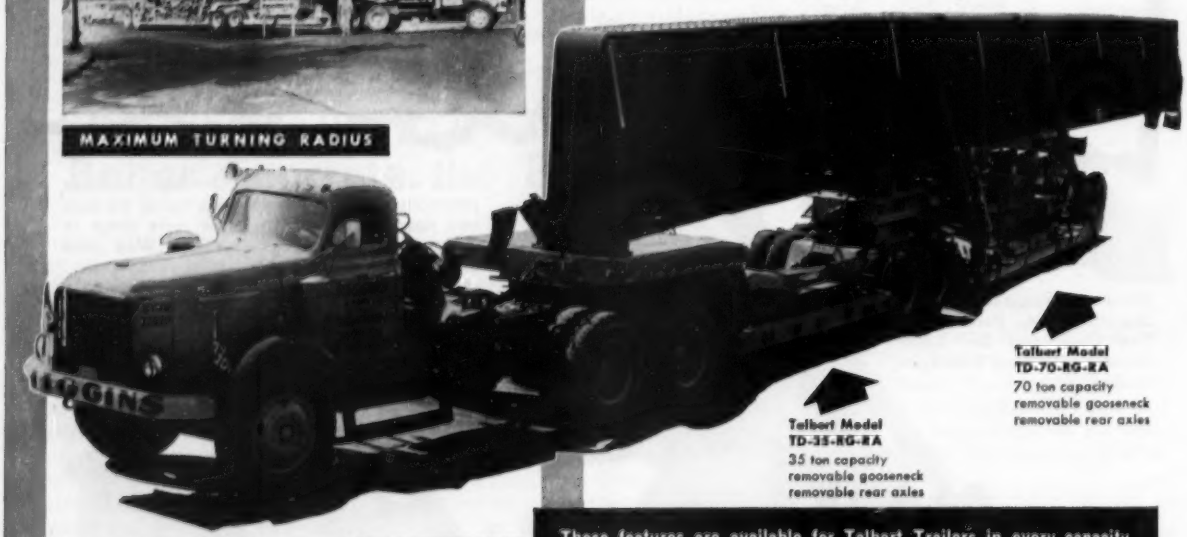
ATHEY PRODUCTS CORPORATION 5631 West 65th Street Chicago 38, Illinois

MINIMUM CLEARANCE

MAXIMUM TURNING RADIUS

"it's just another move" for a TALBERT TRAILER

We're using this picture story of a move made by Wm. Higgins & Sons of Buffalo, N. Y., to demonstrate the adaptability of the Talbert Trailer. The load is supported on the rear trailer and the back bridge (removable rear axles) of the lead trailer . . . with the lead trailer acting as a spacer to give the rig extreme turning radius.



Talbert Model TD-70-RG-RA
70 ton capacity
removable gooseneck
removable rear axles

Talbert Model TD-35-RG-RA
35 ton capacity
removable gooseneck
removable rear axles

These features are available for Talbert Trailers in every capacity

Removable Gooseneck	Raised Center Deck
Fixed Rear Axles	Drop Side Deck
Removable Rear Axles	Beam Deck
Removable Third Axles	Single Axle Dolly
Standard Deck (flat)	Jeep Dolly

Extendable pole trailer reach

For additional details request Catalog No. 104

THE TALBERT CONSTRUCTION EQUIPMENT CO., of Lyons, Illinois manufactures a complete line of low-bed trailers and dump semi-trailers

THE TALBERT-WAY IS THE EASY WAY

Advertisers in this Issue

Number of copies of this issue printed 41,520

(Continued on page 238)

COMING — In July

Construction Methods and Equipment's special issue devoted to Construction Equipment Maintenance. The theme will be "Productive Maintenance."

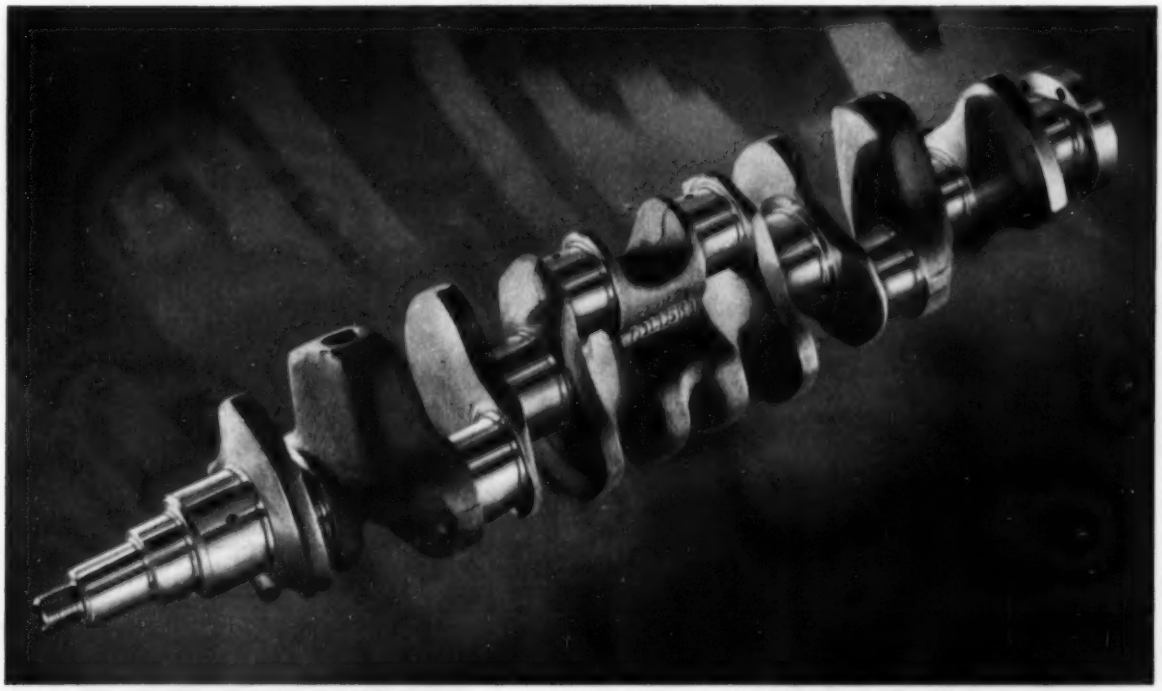
WATCH FOR IT!

Advertisers Index

(Continued from page 237)

(Continued on page 241)

A truck engine needs a "backbone" like this—



From fiery forges and precision machines come extra-strong INTERNATIONAL *crankshafts*. Those used in light-duty models are 17% heavier than the average of comparable forged or cast alloy 6-cylinder designs—for maximum strength and rigidity, long life.

to save you the BIG money

Crankshafts are just one example of INTERNATIONAL all-truck engineering that saves you the *big money*.

Of the five leading makes, only INTERNATIONAL builds a complete line of models that are *all-truck* . . . with no automobile engines or components asked to do a truck job.

You save the most with an INTERNATIONAL that's *all-truck built* to last longer. It earns its keep in lower over-the-years operating and maintenance cost. It pays for itself in use. It saves you—earns you—the *big money*.

Keeping costs down has made INTERNATIONAL the heavy-duty leader for 23 straight years. Let your INTERNATIONAL Dealer or Branch show you the right INTERNATIONAL for your job—built to save you the BIG money.

There's an INTERNATIONAL *exactly right for every construction job—all-truck built to save you the BIG money.* 200 basic models—4,200 to 90,000 lbs. GVW, conventional and COE, 4-wheel, 6-wheel, four-wheel drive. World's widest choice of power and power transmission options.

INTERNATIONAL HARVESTER COMPANY • CHICAGO

INTERNATIONAL® TRUCKS

All-Truck Built to save you the BIG money!

Top TV Comedy! Ronald Colman and Benita Hume in "The Halls of Ivy," CBS-TV, Tuesdays, 8:30 p.m., EDT

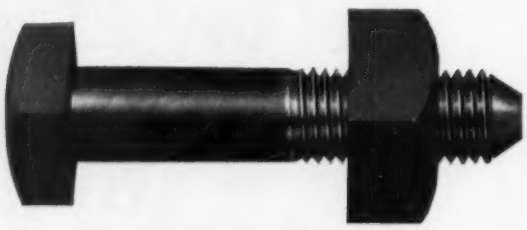
International Harvester Builds **McCORMICK®** Farm Equipment and **FARMALL®** Tractors . . . Motor Trucks . . . Industrial Power . . . Refrigerators and Freezers

For the Big Construction Jobs

RIVETS (SMALL AND LARGE)

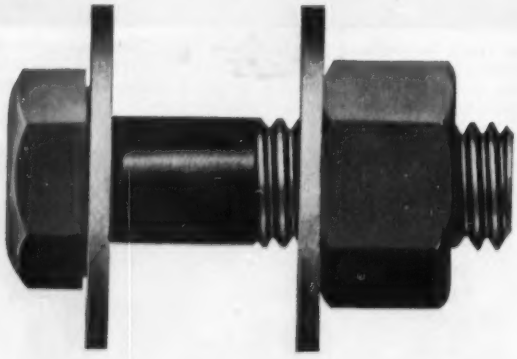
Bethlehem small rivets are furnished in diameters 7/16 in. and smaller, and in lengths 6 in. and shorter. They come with button, cone, countersunk, pan and flat heads.

Large rivets come in sizes from ½ in. to 1¼ in., and in lengths 2 in. and longer. Button, high-button, countersunk, round-top countersunk, cone and pan heads. Also swell neck.



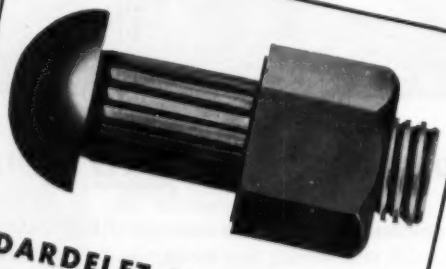
FITTING-UP BOLTS

Furnished in three types: 70,000 lb, low-carbon, untreated; BS-B8, medium-carbon, heat-treated; and BS-B9, medium-carbon, heat-treated. American Standard regular unfinished square heads, plain necks, semi-cone points, and American National coarse threads. Also 60 deg modified Acme Thread.



HIGH-STRENGTH BOLTS

Easy to install, by means of holding wrench and pneumatic impact wrench. Two hardened washers are used with each bolt, one under head, the other under hexagonal nut. The carbon-steel bolts are heat-treated by quenching and tempering to meet requirements of ASTM Specification A-325. Furnished in diameters from ½ in. to 1¼ in., and in varying lengths.



DARDELET RIVET-BOLTS

When driven, the oversize ribs on the shank deform, wedging themselves securely in hole. Bolt has self-locking threads which lock nut against vibration and shock, providing permanently tight joints. Furnished with button, countersunk, and special heads. Wide size range.

For additional information about Bethlehem construction fasteners, just get in touch with the nearest Bethlehem sales office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Bethlehem Bolts are Good Bolts

BETHLEHEM STEEL

Advertisers Index

(Continued from page 238)

(Continued on page 242)

WHERE TO BUY

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT BUSINESS **"OPPORTUNITIES"** EQUIPMENT USED OR RESALE

Advertisers Index

(Continued from page 241)

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SEARCHLIGHT SECTION
(Classified Advertising)
H. E. Hilty, Mgr.

CONSTRUCTION METHODS AND EQUIPMENT

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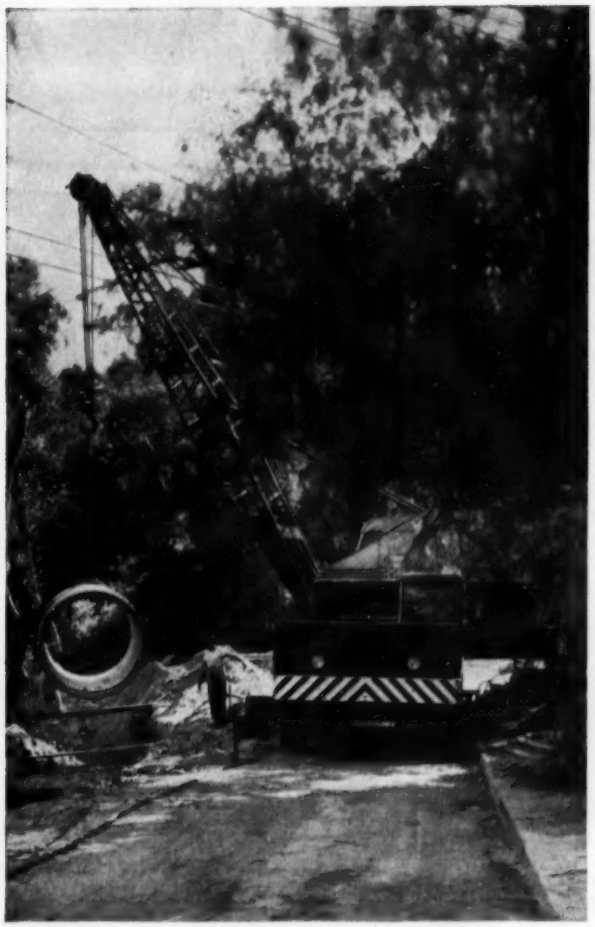


TIGHT SQUEEZE

But Bucyrus-Erie 22-B Transit Crane Makes It Look Easy

This job, located along a narrow, tree-lined residential street in Pasadena, California, required the use of a compact clamshell-crane. A storm sewer trench had to be dug through tough decomposed granite and clay. Then, concrete pipe varying in diameter from 45 to 75 inches had to be installed.

The contractor on the job made the best possible choice: he put a Bucyrus-Erie 22-B Transit Crane to work. Assignments like this are tailor-made for this machine. It's easy to move around with its rubber-tired carrier — can work in tight, narrow quarters. You can use it, as this contractor did, for both excavating and crane work—clamshell, orange peel, and dragline are all operated on the regular crane boom. Above all, it's dependable—a machine you can count on for steady high production every time it starts a job.

Bucyrus-Erie Transit Cranes are available in two sizes — the 15-ton Model 15-B, the 25-ton Model 22-B. Your nearby Bucyrus-Erie distributor can give you complete information.

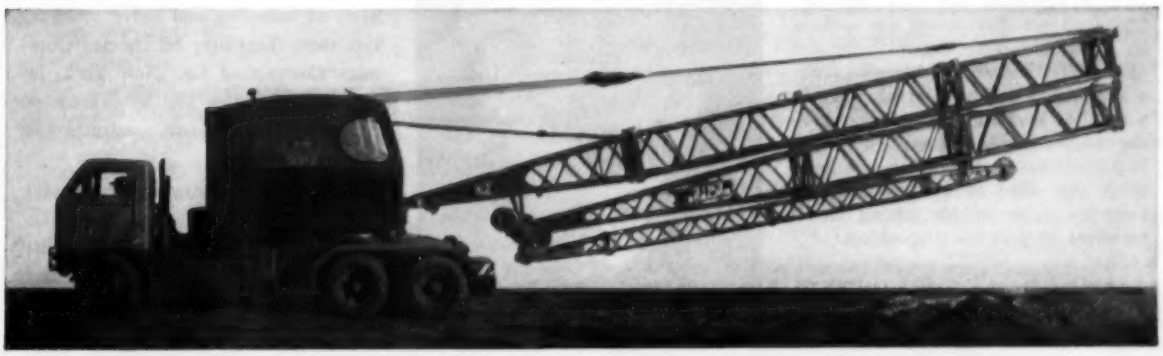
106E55

Power controlled load lowering is one of the features the operator likes best about this 22-B. It helps him set pipe into position quickly and accurately. The job is part of a 10-year flood control project in Los Angeles county.

Boom folding mechanism (optional equipment at extra cost) permits crane booms 60 feet and longer to be folded with jib suspended underneath for moves between jobs.

BUCYRUS ERIE

South Milwaukee, Wisconsin



Methods Memo . . .

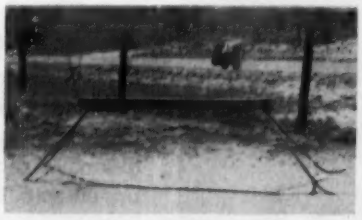
WE NOTE THE CHAMBER OF COMMERCE of the United States has recommended that federal aid be given for rebuilding of 40,000 mi of interstate highways. Under this plan the cost would be borne from general funds up to 60%, with states paying the remainder. There doesn't seem to be much question that our networks of roads will be rebuilt and improved, but the big question is who is going to pay for it and how.

WE RECENTLY PAID a visit to the Buford Dam on the Chattahoochee River, near Atlanta, Ga., to learn how Contractor J. W. Moorman & Son of Muskogee, Okla., moved 4,500,000 yd of earth and rock in less than a year. One quick look was all we needed. Good haul roads and loading facilities are an important factor, but the big factor is the equipment and the operators. We'll tell you how this contractor maintains his equipment and keeps it in top-notch shape soon, but what we can't tell you—you just have to see it for yourself—is how the operators wheel that equipment. They have 22 scrapers, 35 belly-dumps and eight end-dumps hauling all day long. How they keep out of each other's way is a miracle. But they have a system and it must pay off, because they have really moved dirt on this job.

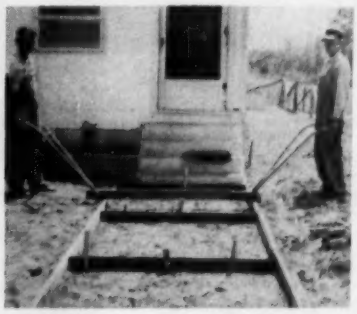
CONTRACTORS who have a need for the new extra-big tractors are proceeding with caution when it comes to making a decision on which one to buy. One contractor we recently talked to felt the big stuff definitely had a place—mostly to help push load scrapers, but as he put it, "I'm not going to be a proving ground on my job with my money for someone else's tractor." His offer to all manufacturers is to bring the equipment down and put it on his job and let him see for himself. But along with the offer he's demanding the equipment be left for a "fair trial." He isn't trying to get dirt moved for nothing by using a factory demonstrator and operator, either. He is willing to pay a reasonable amount of rental per hr worked as shown on the hour meter on the tractor. Even though equipment is difficult to get these days, we don't think that kind of a contractor will have too much trouble getting manufacturers to meet his proposition.

HATS OFF to the DuPont Construction Division for setting an unprecedented safety record in the construction industry. These men, working on 34 heavy building sites in 15 states, operated a full year without a lost-time injury. The 9,000 employees chalked up 7,000,000 exposure hours without so much as a scratch.

THE BIG ALUMINUM SMELTER at Kitimat, British Columbia, keeps right on growing. Right at the moment the installed capacity is 91,500 tons; under construction is 60,000 tons and now comes word that it will be upped another 180,000 tons. Accordingly, the total of new construction under way or scheduled is 240,000 tons. Someone must think there is a pretty fair market throughout the world for aluminum.



PERHAPS YOU WILL RECOGNIZE this home-made screed instantly. But when we were in Florida, sitting in the sun, waiting for a contractor to show up, it occurred to us we seldom see a screed in a non-working condition upside down. So we took a picture. Admittedly, it has little value, but in case you are interested in the screed it's a six footer, made out of a 2x4, topped by ¾-in. angle-iron. The handles were



fashioned out of 1-in. galvanized pipe. Now in case you are interested in what kind of a job it is used on, it makes a dandy sidewalk screed. The men, Ed Hill, left, and Charle Tipton both are employed by George G. Tapper Construction Co., Inc., Port St. Joe, Fla.

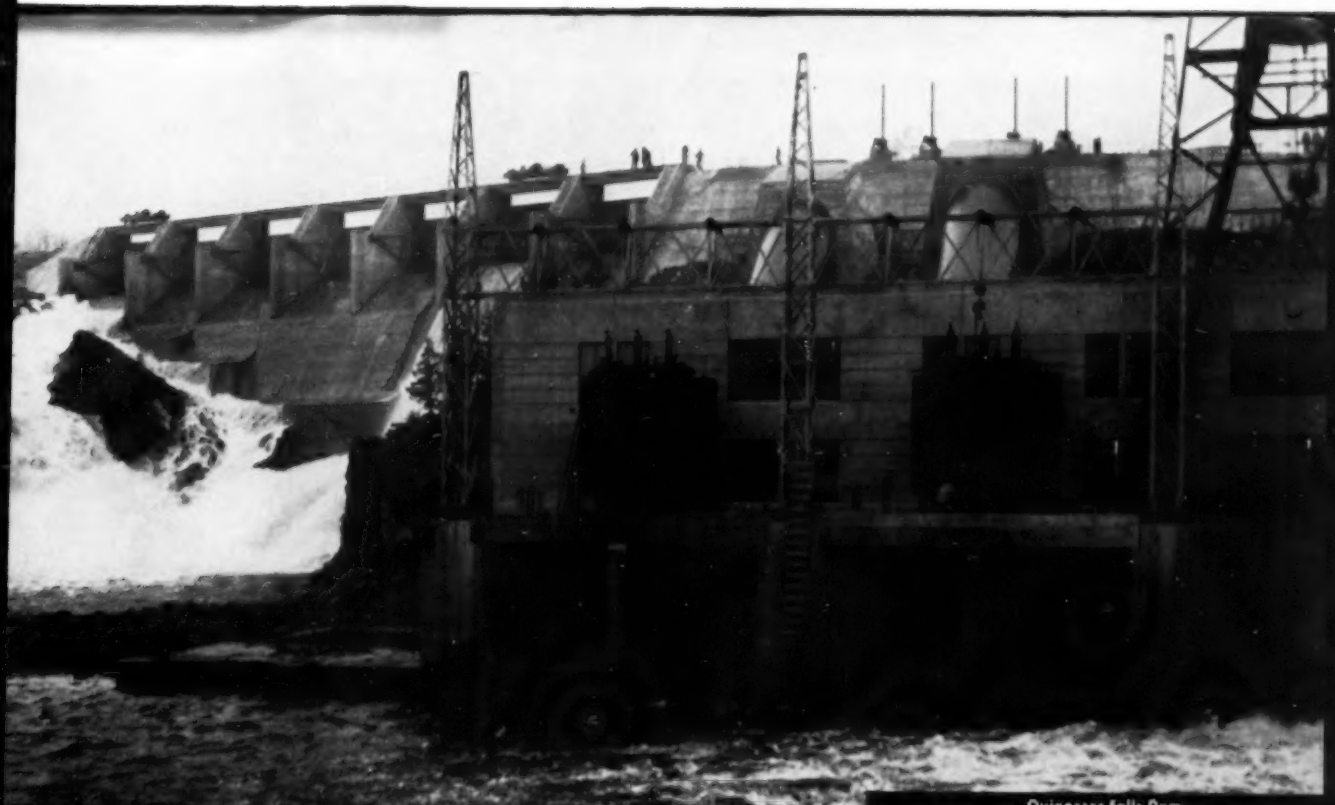
THERE'S A REAL energetic painter out in Midland, Mich., who has probably set some sort of a record. We were informed he recently sprayed a building, belonging to the American Legion, in one day all by himself. He used 54 gal of paint. The release didn't say how big the building was, or how much paint actually got on the structure.

THE THIRD TUBE of the Lincoln Tunnel has to be finished on time or it's going to cost the contractor $10,600 per day in penalties, according to the Port of New York Authority. Latest contract awarded went to James Mitchell Inc., Jersey City, to construct a $1,331,000 ventilation building.

Crimmins Named Moles President

A. Holmes Crimmins has been elected president of The Moles, leading association of tunneling and heavy construction men. Treasurer of Thomas Crimmins Contracting Co., New York, he served during the war as captain of Army Engineers on port construction in the South Pacific.

Other officers elected were: Thomas J. Walsh, Jr., first-vice-president; Richard A. Johnson, second vice-president; Gilbert M. Serber, secretary; Edward G. Johnson, treasurer; and Frank M. Loughman, sergeant-at-arms.



Quinnesec Falls Dam
Owner: Wisconsin Michigan Power Company
Engineer: Mead & Hunt, Inc., Madison, Wisconsin
Contractor: C. R. Meyer & Sons, Oshkosh, Wisconsin
Pozzolith Concrete batched at job site.

POZZOLITH

in concrete for uniform quality...

helps engineers control...

- unit water content
- entrained air
- placing consistency
- rate of hardening
- costs

... and with these end results: greater durability, lower permeability, reduced shrinkage, minimized segregation, increased bond-to-steel.

This dam is one of a long list of outstanding structures built since 1932 in which Pozzolith, an admixture for concrete, has enabled engineers to better control concrete quality.

There are three reasons for the wide and successful use of Pozzolith:

first, ***proven performance***...for many years Pozzolith has made possible more uniform quality concrete despite the inevitable variations in materials, temperature, job types and placing conditions.

second, ***applied know-how***...Master Builders' 70 skilled field technical men work closely with ready-mixed concrete producers, contractors and commercial testing laboratories.

third, ***available everywhere***...Pozzolith Concrete can be supplied for your job, wherever it is located. Close to 1000 ready-mix and job-site plants are already producing concrete of required qualities, with Pozzolith.

Ask us to demonstrate the advantages of Pozzolith for your project.

The MASTER BUILDERS Co

Subsidiary of American-Marietta Company

Western Contractors Corp. cuts drilling costs on $10 Million turnpike contract with TIMKEN® multi-use bits

LOCATION: Sections 13-14, Ohio Turnpike.

OPERATING CONDITIONS: Drilling berm in shale and sandstone.

SECTIONS 13 and 14 of the Ohio Turnpike, in the vicinity of Hudson, is being worked by Western Contracting Corp., of Sioux City, Iowa. At one highway intersection there are about 1,000,000 cubic yards of rock to excavate from an open cut 80 to 90 feet deep. For drilling berm they are using two wagon drills; two more will be added later.

Since the ground is shale and sandstone, Western Contracting found Timken* *multi-use* bits the most economical. Drilling speed and bit life are high. Timken multi-use bits are usually cost-cutters in ordinary ground, when full increments of steel can be drilled—with correct and controlled reconditioning, of course!

But for hard and abrasive ground, for exceptionally deep holes, small-diameter blast holes and constant-gauge holes, Timken carbide insert bits are usually most economical. Their longer life more than compensates for their higher cost.

Both types of Timken bits, in dozens of different sizes, fit the same steel. This means that, if the ground changes, you easily and quickly switch to the type of bit that is most economical. No need to lose time hunting up different steels.

All Timken bits are made from electric furnace Timken fine alloy steel, and have the shoulder union that is designed to keep drilling impact from damaging threads.

It will be worth your while to get our recommendation on what bit to use for your present job. Write: The Timken Rock Bit Engineering Service, The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

your best bet for the best bit...for every job

Timken threaded multi-use rock bit

Timken threaded carbide insert rock bit